

The Orchadian

Official Journal of the Australasian Native Orchid Society Inc.



Caladenia saggicola Milford Forest, Tasmania Photo Geoff Curry

The Orchadian

Official Journal of the Australasian Native Orchid Society Inc.

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Editorial

This issue has a wide variety of interesting topics, some unusual. Geoff Curry and Robyn Lewis present some long-term observations of endangered terrestrials under threat near Hobart in Tasmania. Callyn Farrell compares expected outcomes with early results for his cool-growing *Dendrobium* hybrids. David James, Col Andrews and Lawrie Green focus on warmer growing dendrobiums. Gianni Montalto analyses *Sarcochilus hirticalcar*, which has extended the flowering time for *Sarcochilus* hybrids and introduced unique colour combinations. Pam and Trevor Porteous consider very unusual, variegated orchids. The editor follows up on an earlier report of the saprophytic *Gastrodia procera*. I thank Sheryl Lawson for preparing many of the articles for editing.

Some important instructions to authors:

When submitting articles, the format of recent *Orchadian* issues should be consulted, and the material organised with appropriate headings, email contact addresses, and a short biography. All photographs should be supplied separately as jpegs. Tables, figures, legends to figures as a group and maps must be submitted as separate files from the text, NOT in the text. A Summary follows the title of the article, then an Introduction. More complex and scientific articles or papers should also have Results and Discussion sections.

The purpose of these requirements is to assist the reader to enjoy the information. If these instructions are not followed the editor may return the article and ask the sender to follow the guidelines.

The arrival of *The Orchadian*

Covid 19 has been associated with a significant fall in the rate of contributions received by the Editor. Issues are likely to be delayed until this trend reverses. If you can write or encourage others to contribute on topics in your area or elsewhere, the delays in the arrival of the journal will be reduced.

Peter Adams

President's Report

The Covid pandemic continues to disrupt orchid meetings, judging and shows for a second year. ANOS needs to find a way forward, as the likely opening up and easing of restrictions develops in early 2022. The Annual General Meeting planned for August 2021 was cancelled due to ongoing travel and other restrictions, and it is very unlikely that a face-to-face meeting could be held in the foreseeable months. Council has reviewed the options and decided to hold an AGM by Zoom videoconference on Monday 29th November 2021 at 8 pm (see Notice of Meeting). Most importantly, the nomination of new members to the Council is vital as several current members are nearing the end of their time in key roles and will be moving on. The continuity and effectiveness of ANOS Inc and the Council depend on renewal and it is a collective responsibility of the membership to ensure that there are suitable

nominations for all vacant positions.

I think it is important to attempt to hold a face-to-face gathering of ANOS members in 2022 as soon as restrictions allow, and it is safe to travel. There may be an event where this could occur and provide, after a long hiatus in interactions, a positive way forward with renewed enthusiasm for ANOS Inc. If you have ideas or comments to make on this issue, please direct them to the Secretary so Council can include them in discussions.

I look forward to seeing you in 2022.

Peter Adams

ANOS INC.

Notice of Annual General Meeting (AGM)

Date: Monday 29th November 2021

Time: 8 pm Australian Daylight Saving Time

Because of the disruptions and challenges caused by COVID-19, this AGM will be held by Zoom video-conference only with no face-to-face meeting. The AGM is scheduled to commence at 8.00pm but the Zoom waiting room will be open at least one hour earlier to facilitate the registration of proxies.

All positions will be declared vacant.

Nominations for all Council positions are called for, and must be in the hands of the Secretary no later than Sunday the 21st November 2021.

A nomination form for Council positions and further information about the Zoom video-conference AGM including the meeting link will be provided to members by e-mail shortly.

Any member who wishes to obtain further information about the AGM but has not provided an email contact address should contact the Secretary as soon as possible, either in writing at the address set out below or by telephone on 02 6600 3535 during business hours, to provide an email contact address or request the material be posted to them.

Signed: Roslyn Capell
Secretary, ANOS Inc, PO Box 1549, Ballina, 2478
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Orchid monitoring in Milford Forest, Tasmania - *Caladenia caudata* Nicholls, *Caladenia saggicola* D.L.Jones and *Prasophyllum milfordense* D.L.Jones

Text Geoff Curry and Robyn Lewis Photos Geoff Curry | geoff.curry59@gmail.com

Summary

Three threatened endemic orchids were monitored in Milford Forest, Tasmania and numbers increased between 2009 and 2020. *Caladenia saggicola* has increased with a record number of 763 plants in 2020. *Prasophyllum milfordense* has increased to a lesser degree, with 319 plants identified in 2020. Twenty plants of the natural hybrid *C. caudata* x *C. saggicola* were seen in 2020. Higher numbers appear to correlate with greater winter and spring rainfall. Management strategies involve light fuel reduction burns and slashing. Slashing is preferred.

Introduction

Milford Forest contains approximately 40 hectares of old-growth *Eucalyptus viminalis* coastal forest, a Threatened Native Vegetation Community. It has been managed for the conservation of natural values since 1829. It extends down to the Pittwater shoreline and is unique in southeast Tasmania as it has never been logged or cleared and has not been grazed for over 100 years. It contains the threatened endemic orchids *Caladenia saggicola* D.L.Jones, *Prasophyllum milfordense* D.L.Jones (known from this one site only) and *Caladenia caudata* Nicholls.

The three species on the private property 'Milford' were surveyed in spring 2020. These surveys continue the annual monitoring initially conducted by the Threatened Species Section of the Department of Parks, Industries, Water and Environment (DPIPWE) and volunteer members of Threatened Plants Tasmania, to better understand the ecology and persistence of species over time, and to monitor and identify appropriate management and threats (Schahinger 2009; Carter 2020; Lewis and Curry 2021). Since 2019 these surveys have

been undertaken by members of Threatened Plants Tasmania Inc and Milford Forest Landcare Group. Table 1 shows the dates of the surveys undertaken between 2009–20.

Caladenia saggicola (sagg spider-orchid) is listed as Critically Endangered under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC) and Endangered under the Threatened Species Protection Act 1995 (TSPA).

Prasophyllum milfordense (milford leek-orchid) is listed as Critically Endangered under the EPBC and Endangered under the TSPA.

Caladenia caudata (tailed spider-orchid) is listed as Vulnerable on EPBC and TSPA. *Caladenia caudata* and a natural hybrid between *C. caudata* and *C. saggicola* (Wapstra et al 2019) also grow on the site, but these plants had not been recorded before the 2020 survey.

Methods

Milford Forest contains 10 Management Units, plus some other areas to the east and NE not specified in this map (Fig. 1). Line transects were conducted across the previously known extent of each orchid species, and four previously unsurveyed areas to the NW and NE, nearer to the Tasman Hwy (Management Units 4–8). Each survey took approx. 6 hours on each survey day, recording all individual plants, their condition and reproductive status.

Surveyors were spaced 3–5 m apart, in an endeavour not to miss any individual orchids, although this is inevitable, especially for those not yet in full flower. *Prasophyllum milfordense* is very hard to see when only in leaf, or once the flowers are spent. Thus, the count is considered incomplete.

Year	<i>Caladenia saggicola</i>	<i>Prasophyllum milfordense</i>
2009	26 September	10 November
2010	17 & 21 October	21 November
2011	15 September	6 November
2012	23 September	9 & 13 November
2013	15 September	11 & 15 November
2014	20 September	12 November
2015	3 October	1 November
2016	14 September	10 November
2017	12 October	11 November
2018	22 September	10 November
2019	20 September	12 November
2020	12 September	14 November

Table 1. Milford Orchid Survey Dates 2009–20.

Results

Caladenia saggicola: There were 763 plants observed, 714 flowering, 47 buds, and 2 in leaf. This compared to 492 plants recorded in 2019 and is a record count for this species since surveys began in 2009 (Table 2). Almost all the plants found were observed in the vicinity of previously recorded locations. Approximately five plants were in the previously unsurveyed or partly-surveyed Management Units 4–8.

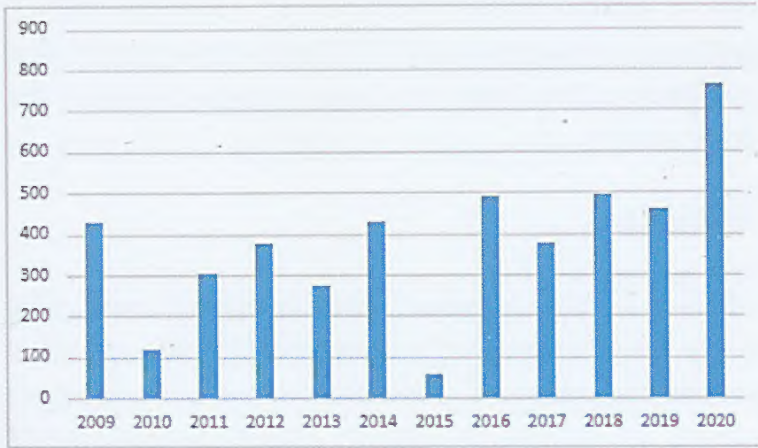


Table 2. *Caladenia saggicola* survey – numbers of plants in years.

Prasophyllum milfordense: There were 319 plants observed, compared with 65 plants in 2019 and 29 plants in 2018. The maximum record year was 2016 (347 plants). An increasing upward trend is observed with time (Table 3) although it is not as significant as for *Caladenia saggicola*.

Caladenia caudata: Nine flowering plants were observed.

Caladenia caudata X *Caladenia saggicola*: 20 flowering plants were observed.

Prasophyllum milfordense seems to flower best with around 50% open canopy (Lewis pers. obs.). This appears similar to *C. saggicola*, but the latter can continue to flower under considerable wattle regrowth to about 2 m tall, provided the ground is still open (G. Curry and R. Lewis pers. obs.).

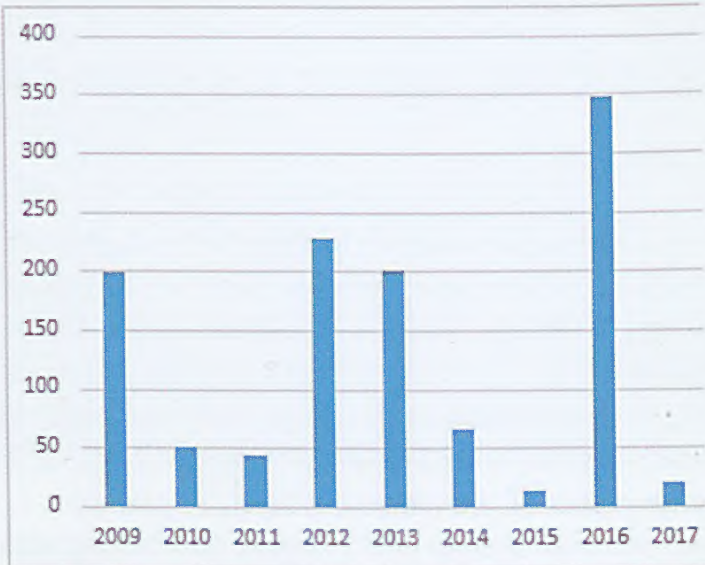


Table 3. *Prasophyllum milfordense* survey – numbers of plants in years.

The distribution of plants observed covers much of the previously recorded range of the species, plus seven additional plants in Management Unit 4. Two individuals previously observed in Management Unit 6 were not seen in 2020 (but could be dormant or were grazed by native animals). There were likely to be individuals not seen, either being still in bud or with flowers fading; in both instances they are very difficult to see.

Discussion

The long-term trend for both *Caladenia* species from 2009–2020 appears upward, especially for *Caladenia saggicola*, and if the 2021 season for *P. milfordense* is as good, this population could be considered to be growing. The overall increase in observed plants in spring 2020 may be attributed in part due to the extremely favourable/wet growing conditions in winter 2020 and the mild, wet spring, plus improved management methods, in particular replacing low intensity burning with the controlled slashing of the Management Units. From our impressions, this management technique is working, not just for the orchid species, but for general forest health.



Figure 1: Management Units within Milford Forest.

It appears that there is a significant correlation with rainfall (Schahinger 2017), in particular in winter and spring. This needs further investigation, especially using pre-2018 data, and looking at evapotranspiration, and mid-late autumn rainfall. Abundance appears to be higher when winter and spring rainfall is above the long-term mean.

The impact of the previous years' rainfall on the subsequent year's vegetative growth and flowering

of both species needs investigation. Both species appear to be growing in little-understood mycorrhizal associations with soil fungi in association with the predominant forest tree *Eucalyptus viminalis*, and possibly also with the native cherry *Exocarpus cupressiformis* (Lewis, pers. obs.). Weather events, particularly those affecting soil moisture and evapotranspiration, are likely to have an impact on the soil fungi, which may then have effects on the orchid species lasting more than one season.



Caladenia caudata



Caladenia caudata



Caladenia caudata X *Caladenia saggicola*



Caladenia saggicola



Caladenia saggicola



Prasophyllum milfordense

Orchid tubers act as an energy store during the dormant summer and early autumn season and may persist for up to 20 years (Curry and Lewis, pers. obs.). They may be affected by prolonged dry periods and could take some time to recover. The low count of orchids in 2015 may have been affected by low soil moisture from previous seasons. It is recommended that soil moisture meters with remote sensing be installed.

Another explanation for low orchid counts during particularly dry years is that the orchids may develop some leaves, but not flower. Both species but especially *Prasophyllum milfordense* are difficult to see when not in flower. Better geolocation in future may assist in looking for individuals not in flower.

Additionally, flowers may not be pollinated or set viable seed in dry years. Almost nothing is known about the conditions required for the seed of either species to germinate in the wild. *Caladenia saggicola* has recently been successfully germinated by the Royal Botanic Gardens in Hobart.

Overall, there needs to be more study of the correlations with rainfall, particularly given the overall decline in average rainfall observed since

record-keeping began, and potential changes in rainfall seasonality.

Forest Management

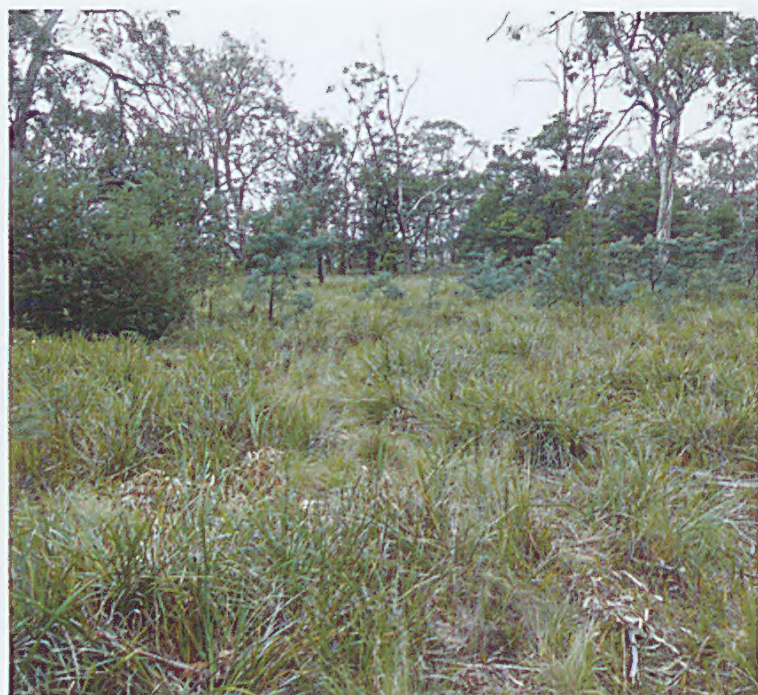
Milford Forest contains 10 Management Units, plus some other areas to the east and NE not specified in this map. The main Management Units containing *Prasophyllum milfordense* and *Caladenia saggicola* are 1a, 1b, 3, 4 and 5 (Fig. 1). Neither of these species has been recorded east of Unit 6, however, this does not mean that they are not there, or that they might not return, especially if bracken, a known inhibitor of herbaceous plant, can be removed.

Milford Forest had a fire management plan written in 2008 (AVK Environmental Management 2008), which described a fire management plan for the next 15 years. The plan contains nine objectives, one of which is to minimise the fire risk to threatened flora and fauna and another to implement a mosaic burning program to maintain and enhance habitat diversity, particularly for orchids.

The plan advised that burns should not be undertaken in the known populations of the Milford Leek Orchid (*Prasophyllum milfordense*) and Sagg Spider-orchid



Good *Caladenia saggiticola* and *Prasophyllum milfordense* habitat, mature *Eucalyptus viminalis* (white gum) woodlands with *Acacia dealbata* (silver wattle) and *Exocarpos cupressiformis* (native cherry) trees and a ground layer dominated by *Lomandra longifolia* (sagg).



Good *Caladenia saggiticola* and *Prasophyllum milfordense* habitat, mature *Eucalyptus viminalis* (white gum) woodlands with *Acacia dealbata* (silver wattle) and *Exocarpos cupressiformis* (native cherry) trees and a ground layer dominated by *Lomandra longifolia* (sagg).



Orchid habitat slashed late June 2021.

(*Caladenia saggiticola*) until a survey was carried out to determine the approximate extent of each population and the number of plants. It recommended that once the baseline data on each population had been collected, half the population could be burnt, and the other half of the population not burnt until the recovery of the two species following the first burn had been confirmed.

Management Unit 1, containing known orchid populations, was split into subunits 1a and 1b, to reflect this. It is believed that unit 1b was burnt in approx. 2000 and unit 3 in approx. 2002. (Lewis, pers. comm).

Glazik (2001) recommended against the use of fire:

Monitor the orchid populations to check on known populations and to identify new ones. Surveys every 5 years or so may also reveal the return of species lying dormant in the soil as seeds, tubers, or bulbs. Do not burn the area. It is likely that at some point during this time fire would pass through the area without it being planned. So it is probably best to allow things to progress naturally. Monitoring and watching for changes is the best way to determine whether or not a fire is required, in this sort of area.

Therefore the use of fire has been reconsidered,



Caladenia saggicola growing in the slashed area, next to disturbance caused by rabbits.



Caladenia saggicola and *Prasophyllum milfordense* habitat with *Pteridium esculentum* (bracken) starting to dominate the understory.

because of the following factors: increased temperatures since that time, and other adverse climatic factors, the cost of arranging TFS personnel and fire trucks, limitations on smoke placed by adjacent Hobart Airport, previous damage caused by low-intensity burns getting out of control and into the tree canopy, deaths of mature trees due to Ginger Tree Syndrome dieback since approx. 2015, plus the impact on other plant species and ground-dwelling fauna, birds and nesting hollows.

Increasingly, the window of opportunity for burning has become too small to be practical. Application of prescribed burning is limited by weather, fuel moisture, and other factors. Proximity to a main highway and the Hobart Airport also limits the ease of burning at desired times. Burning is also known to increase both bracken and wattle regrowth, the two least desirable species from the orchid competition point of view. Milford Forest has not experienced a major bushfire since at least 1829, and it may partly be due to this that the orchid species survive. Avoiding fire is also critically important to maintain bird nesting hollows both in the canopy and near the ground, as part of a healthy ecosystem. Thus, an alternative fuel reduction and open canopy maintenance method of selective slashing has been

applied since 2016.

The long-term effects of slashing are not fully understood but current indications point to slashing as being equally if not more successful than burning. Slashing also has much less impact on other values, such as old hollow trees for nesting hollows, and *E. viminalis* seedlings. Slashing is done carefully and selectively to retain these, plus native cherry trees and banksias, all of which form an important part of the forest ecosystem. The main objective of slashing is to selectively remove wattles and bracken, both of which appear to inhibit the orchids, the first by reduced light (Lewis, pers. obs.) and water/nutrient competition, and the second via light reduction, competition for water/nutrients, and the production of phytotoxins which inhibit the growth of other plants. Slashing also provides mulch, potentially increasing water retention and carbon matter in the soil.

From direct observation, it is also becoming clear that slashing done in early winter (early June to mid-July) is preferable to late winter, as *Caladenia saggicola* leaves begin to appear in late July/early August, and with global warming, this may occur earlier. Potential damage to the plants can thus be avoided. All management is done at the direct

Management Unit	Fire and slashing	<i>Caladenia saggicola</i> Sept 2020	<i>Prasophyllum milfordense</i> Nov 2020	Management Recommendation
1a	Unknown	Flowering well	Flowering well	To be slashed in early winter 2021.
1b	Burnt 2000?	Flowering well	Flowering well	To be slashed in early winter 2021.
3	Burnt 2002? Last burnt Apr 2013. Slashed late winter 2018.	Flowering well	Flowering well	Next burn/slash would be c. 2028 according to the Fire Management Plan. It may be worth slashing sooner, if there are consecutive years where threatened orchids are absent. Significant wattle regrowth suggests slashing in 2022.
4	Last burnt Apr 2009. Slashed early Winter 2019.	Flowering well	Flowering well	Significant wattle regrowth suggests slashing in 2022.
5	Last burnt Apr 2015	Flowering well	Flowering well	Next burn would be c. 2030 according to Management Plan. However, wattle regrowth is significant, and this area will be slashed in winter 2021.
6	Fire history unknown. Likely burnt in 1990s	Not known to occur within this Management Unit	Few individuals. Not recorded at the known side at eastern edge of Unit along easement.	Management Plan recommends slashing in winter 2022. May be done in 2021 if time and resources permit.

Table 4. Milford Forest Management Unit history.

expense of the current custodian Robyn Lewis, there being no government funding available to manage these critically endangered orchid species.

The status of each Management Unit in terms of burning and slashing is summarised in Table 4. *Prasophyllum milfordense* and *C. saggicola* are not known to occur in Management Units 2, 7 or 8. Units 9 and 10 appear to be outside their range. This may be because of insufficient surveys being undertaken (although the areas were walked through in 2020). Perhaps their absence is because of the significant amount of understory growth, particularly bracken

infestation of these areas. Surveys are required in the years following management intervention (slashing) to check for and record any plants that may appear.

This breakdown by Management Unit will be conducted for data from 2018–20 before the 2021 surveys. It will then enable a proper correlation of management with flowering/plant counts in the year of burning/slashing and subsequent years. However, results to date, especially in 2020, indicate that slashing appears to be achieving superior results, and appears better for forest health overall (Curry and Lewis, pers. obs.)

Current Threats

Despite the successful management of Milford Forest, threats to its existence and the health of its ecosystem continue. The most notable in recent years was the proposal in 2019 by the Department of State Growth in Tasmania to widen the Tasman Highway and to locate a large roundabout in Management Units 4 and 5.

This proposal was inappropriate, and the designs have been modified. However, the currently proposed highway widening adjacent to Milford Forest still has the potential to adversely affect both orchid species and the habitat on which their sustained survival depends i.e. the threatened old-growth *E. viminalis* coastal forest.

Potential impacts from this proposed development include

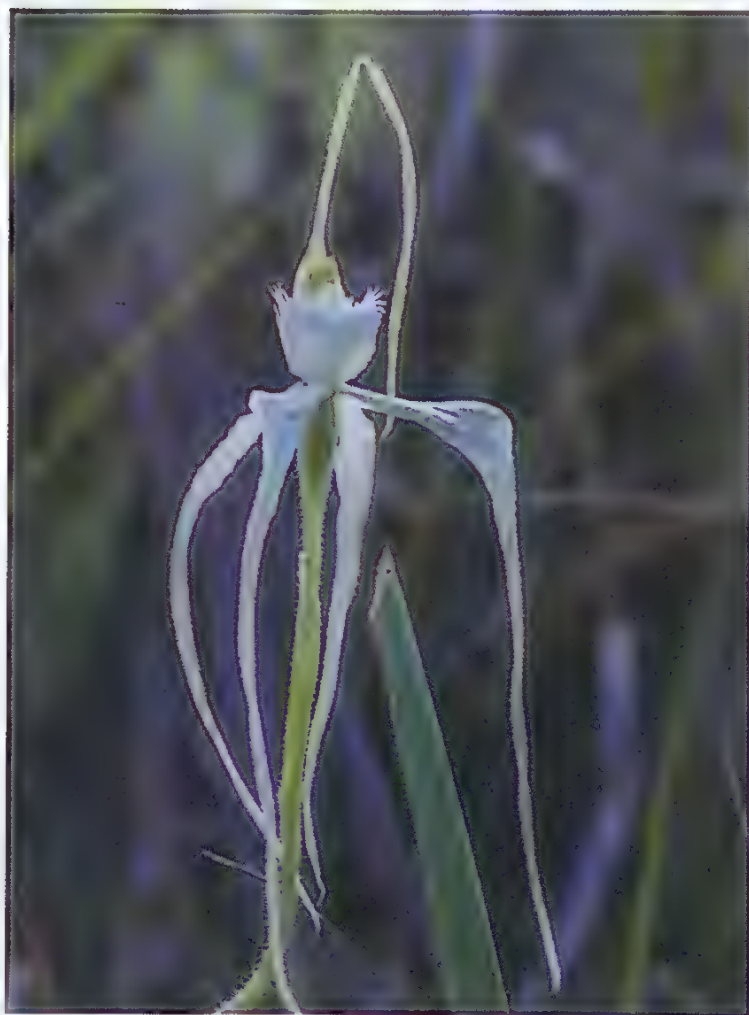
- Increased volume of water runoff exacerbating weed growth and affecting the current ecosystem balance
- Ingress of pollutants from the highway traffic
- Increased risk of accidents with increased traffic volumes, and the attendant risk from firefighting and other chemicals
- Herbicides from drains, which will now carry more water and promote more weed/grass growth requiring control
- Potentially more runoff points from the Tasmania Golf Club
- Introduction of weed seeds
- Fungal infections from earthworks. *Phytophthora cinnamomi*) is considered to provide a significant threat to heathland vegetation, where it can lead to local extinctions and alter relative abundances of plant species. Earthworks are known to exacerbate the spread of the fungus with far-reaching effects on adjacent native vegetation (North and Riley 2001) There is currently no *Phytophthora* known in Milford Forest.
- Loss of *Eucalyptus viminalis* mature trees, either by direct removal or due to increased wind exposure and fire.
- Loss of buffer shrubs such as bursarias and

banksias along the current property boundary, which provide significant protection against northwest winds. Orchid seeds are wind-dispersed, and if blown out of suitable habitat areas, they will not germinate. A replacement buffer planting of understory shrub species along the new highway verges inside the new property boundary needs to be considered. Orchid flowers are very prone to desiccation by drying winds, which may reduce pollination.

- Anything that affects insect pollinators may have an impact. *Prasophyllum milfordense* has been observed to be pollinated by up to six insect species (G. Curry, M. Wells, pers. comm.)
- Increased risk of uncontrolled fire

Glazik (2001) stated:

The other significant thing about (Milford Forest) is the (good) condition and size (approx. 40ha). While there are weeds, and in some areas there is a lack of species diversity, overall the area still retains the many complex components that make up this ecosystem. The large patch size means that it



Caladenia saggicola pure white form.

is likely to remain sustainable as long as no further activities like industry ... (occur) ... in the area.

Private development is not considered a threat, as it would be prevented under the EPBC Act. However, proposals by governments are less constrained. There are also ongoing threats posed by climate change.

Recommendations

Short-term actions include correlating the burning and slashing history within each Management Unit from 2018–20 with the orchid survey data and weather data, to ascertain effects and make more informed recommendations around future management for orchid species.

Determine the trigger points when management intervention is recommended, such as absence or significant decline in orchids for two consecutive years from a Management Unit and percentage of vegetation cover by personal observation, such as after wetter years.

Slashing should be continued to conserve *E. viminalis* seedlings and young growth and *Exocarpos cupressiformis*, due to the likely symbiotic relationship of both orchid species and/or their mycorrhizal fungi with the former and between *E.cupressiformis* and *E.viminalis*. A survey of *E.cupressiformis* would be desirable, plus the Oyster Bay pine *Callitris rhomboidei*. The main competitor for both species appears to be bracken. It is promoted by fire but can be gradually reduced by slashing. This is further indication that the adaptive management replacement of fire as a management tool by periodic slashing should be continued.

Acknowledgements

The authors would like to thank all Threatened Plants Tasmania Inc survey volunteers, and Richard Schahinger and Oberon Carter, on whose previous reports the structure of this 2020 report is based.

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Geoff Curry is President of Threatened Plants Tasmania Inc.

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More Observations of *Gastrodia procera* G.W. Carr in the Dandenong Ranges, Victoria

Text and photos Peter B. Adams. School of Biosciences, University of Melbourne and National Herbarium, Royal Botanic Gardens, Melbourne | pbadams45@gmail.com

Summary

A large colony of *Gastrodia procera* with flower stems which was observed in October 2010 (Adams 2017) has declined in numbers by October 2020. New smaller colonies were noted 60-80 m to the south in decomposing leaf litter under garden *Rhododendron* and *Cryptomeria japonica* shrubs. These plants may have arisen from fresh seed dispersal from the original colony by north winds in early summer periods.

Introduction

Gastrodia procera G.W.Carr, the tall potato orchid, is a leafless obligate myco-heterotroph with no obvious chlorophyll and depends on fungi in a large tuber throughout the life cycle. There are seven Australian species of *Gastrodia* (Jones 2006) that have similar flowers. *Gastrodia procera* was shown to be self-pollinating (Adams 2017).

The dark purple flower stems develop quickly in spring and early summer, growing up to 1.2 m high. They do not show flower reflexing, a feature of *G. sesamoides* (cinnamon bells) which also occurs in the Dandenong Ranges. The pale brown seed capsules are also quickly produced and liberate seed in early summer. Plants are scattered locally either singly or in small groups in the leaf litter of *Eucalyptus obliqua* L'Hér. forest and are also found in gardens with a deep layer of decomposing leaf litter.

This study is an extension of 22 years of observations of a large colony originally observed under a garden *Cedrus deodora* (Roxb. ex D.Don) G.Don, (Indian cedar), after many

years of dormancy during a drought period.

Results

Original Colony

Only three flower stems emerged in October 2020 from the 10 x 6 m area previously described (Adams 2017). They were close together at the western end of the colony. Excavation to 10 cm depth (noted previously to be greater than the depth of the original tubers) failed to locate any signs of tubers elsewhere in the colony, leading to the conclusion that these had declined and died out. The size of mature tubers in 2010 was up to 16 cm long. Two of the three stems present in October 2020 were tall, with 23 and 31 flowers, and the third was short, with three flowers. All stems produced a high percentage of seed capsules (Table 1). A large solitary plant at site B was present in October 2020 under a planted *Eucalyptus* sp. to the south of the colony, 6 m away. It bore 34 flowers, with 32 converting to seed capsules.

New Colonies

New colonies were found at sites C, D, E and F, to the southwest of the original colony and approximately in a straight line. At site C, seven plants were found under a *Rhododendron* hybrid bush. The stems were medium height, 38–57 cm, with 7–22 flowers. Several tubers were gently uncovered and they were small, 3–8 cm long, suggesting young plants. Site D had three plants under another *Rhododendron* hybrid bush. They were of medium size, 24–30 cm, with small flower numbers of 2–4 per stem. The tubers were also small, suggesting young

Area (no. plants)	Canopy (litter source)	Litter depth cm	Plant height cm	No. flowers	Capsule set
A (3)	<i>Cedrus deodara</i>	15.5	84,33,85	23,3,31	16,3,24
B (1)	<i>Eucalyptus</i> sp.; pine needles	16	86	34	32
C (7)	<i>Rhododendron</i> hybrid	8	56,55,57,44,38,50,48	19,22,19,21,7,15,8	11,18,17,0,0,9,7 Some grazed
D (3)	<i>Rhododendron</i> hybrids; <i>Cryptomeria japonica</i>	6	27,30,24	4,2,4	4,2,2
E (7)	<i>Cupressus</i> cypress	6	52,61,58,83,63,62,59	12,16,15,34,14,14,7	All grazed
F(2+)	<i>Taxodium</i> <i>cupressacea</i> ; mixed conifers	9			

Table 1. Details of flowering plants of *Gastrodia procera*.

plants.

Site E had seven plants under a *Camellia japonica* shrub. They were medium to tall stems, 52–83 cm in height, with variable flower numbers of 7–34. The underground tubers were small to large, suggesting some young plants.

At Site F several plants emerged under *Taxodium* and *Cryptomeria japonica* exotic conifer shrubs in deep leaf litter. Limited exploration of the litter found several other unflowered tubers which were 2–5 cm long. At least two stems had been grazed by rabbits, and there was no flowering here.

Stems emerged at the beginning of November and flowers started opening in the third week of November. Self-pollination and capsule development started around 24 November. Weather conditions in this period were wet to warm with frequent rain.

Discussion

Climate is likely to be a key factor in the long term survival of orchids that are dependent on endogenous fungus for nutrition. The 2020 year was wetter than average and may have contributed to the decline of the original colony at site A, and the development of new colonies at sites C–F. In 2010 the tubers at Site A were large and mature in the 10 cm deep fine leaf litter when a few showed signs of early decay. Wet conditions in subsequent years may have contributed to the decay of the older tubers, except in the western corner which is more elevated and better drained. A detailed explanation of the decline is not possible.

Site B is in an elevated position with shallow *Eucalyptus* leaf litter, which may have assisted survival. New colonies at sites C–F were the most intriguing find in spring 2020. They are 50–70 m from site A and southwest. These sites have decaying litter under shrub canopies of *Rhododendron* hybrids and *Cryptomeria japonica*. As no flower stems have been noted here during the 25-year study period, and the tubers are consistently small with short flower stems, the origin of the plants is postulated to be from seed dispersal from site A. In the surrounding bushland and house gardens, no sightings have been made of plants of *G. procera* during the study period, but the possibility of seed dispersal from unnoticed plants in the nearby forest cannot be excluded.



Site A, remaining plants in original colony.



Site A, original colony. Note buds, open and closing flowers.



Site A, original colony, single flower, orange-tipped labellum.



Site B, solitary plant in Eucalyptus litter.



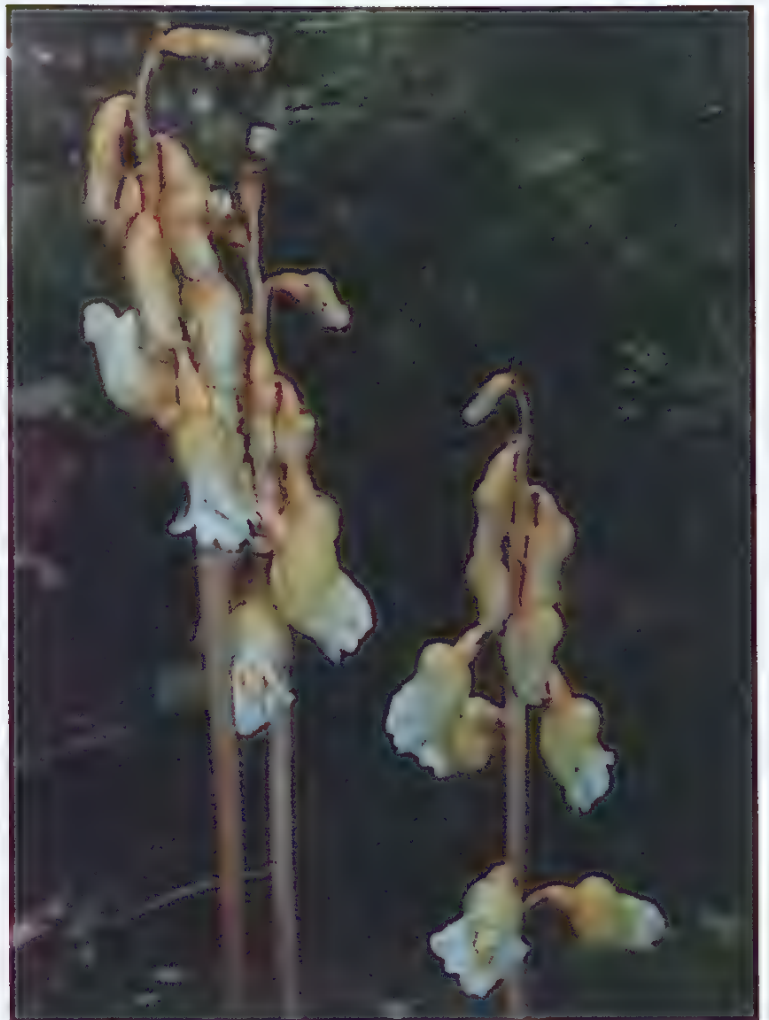
Site C, small young plants, greenish colour.



Site C, small young plants, pale brown colour.



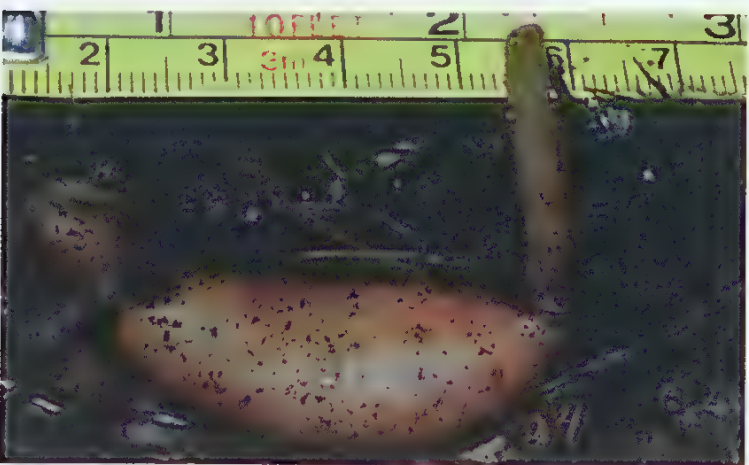
Site D, small, short plant in *Cryptomeria* litter (shrub in background)



Site E, moderate and small-sized plants with narrower flowers, in conifer litter.



Site E, small plant with broader flower.



Site F, small tuber, flower stem grazed by rabbits.

North winds associated with high pressure systems are a dominant feature of early to mid-summer at this site and may be the explanation of the dispersal of seed. There is a side road that partially drains onto the shrub garden along the line of sites C-F but it does not extend to the sites under low shrub canopies and is less likely to be a factor in seed dispersal.

The most likely explanation for the lack of expansion from site A to sites C-F in previous years may be the lack of sufficient litter in

previous years. The shrubs are over 20 years old and the litter layer has developed gradually to be similar now to the depth seen under the *Cedrus deodara*.

Gastrodia procera is an adaptable Australian species that can extend into disrupted sites in exotic gardens under suitable conditions, providing there is an adequate depth of decomposing litter and adequate rainfall. The study will continue over the next few years, monitoring for further developments including possible other new sites

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Adams PB 2017 Observations of *Gastrodia procera* G.W.Carr (Gastrodieae) in the Dandenong Ranges, Victoria. *The Orchadian* 19:14–22.

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Sharing the Joy: Reflections on Hybridisation of Cool Growing Dendrobiums

Text Callyn Farrell | dunoau@gmail.com

Summary

Predicting results of new hybrids is sometimes accurate, but often results are not predictable. Observations of parents with a logical approach to likely outcomes is important, and the creative approach also has merit. Early outcomes are presented for some crosses, which may or may not indicate the success of the cross overall with more flowering results.

Introduction

Hybridising Australasian native orchids is an exciting activity for both new and experienced growers - endless possibilities, chances of success, and the desire to create novel outcomes. Together, these create a context that draws on logical observation and creativity.

Logical observation refers to observing plants that have been exhibited at shows or have been grown with an understanding of their breeding. It may also include observing the hybridising patterns of breeders who have come before you. In contrast, creativity requires a hybridiser to think in broader ways, to explore plants that have not been used before, and think of outcomes that may not be guaranteed. Also valuable to hybridisers is an understanding of how certain species and/or hybrids have contributed to progeny in the past. Of course, this does not guarantee a specific outcome.

Orchid hybridisation has successes and failures, but informed research and creativity help shape breeding plans and predictions of the outcome. Despite this, most breeding is experimental, with no hard science behind it. This is especially true when talking about Australasian orchids. Regardless, educated experimental breeding has undoubtedly led to respectable developments in this group of plants throughout the last thirty years.

Ross Maidment of Aranbeem Orchids thinks of orchid hybridisers in three categories: The Dreamers, The Awarders, and The Visionaries. The Dreamers are those who cross two plants, hoping to take the best characteristics from each and create something better. Awarders refers to those who breed between two awarded plants to hopefully obtain some awardable progeny. Visionaries refer to those who understand the breeding plans of those before them and have well-planned and informed breeding plans of their own. Regardless of the categories we place ourselves within, most of the time we are still working with plants that are little known. Hence, the probability of achieving the planned result and/or success is highly variable. Most crosses produce a heterogeneous result, and some crosses produce something completely different from what was expected, which could be positive or negative.

Many successful crosses are distributed to the broader orchid growing community through catalogues, a form of sharing where a plant is exchanged for a monetary sum, exchanged with other plants, or in some cases given with nothing expected in return. These catalogues sometimes have predictions written by the hybridiser or the proprietor, providing an overview of what the individual imagines or predicts the cross may produce. Growers use these predictions to decide what they would like to purchase and devote the space and energy to in their collection. The predictions are rarely reviewed concerning outcomes.

This article looks at a subset of crosses released by Down Under Native Orchids through the 2016 and 2018 spring catalogues. I report the descriptions as I wrote them in these catalogues and provide examples of the outcomes. Further, I compare the predictions and the outcomes to see if there is congruence. These reflective observations are an extremely restricted sample of all plants produced from each cross and therefore may not be representative of the overall results. Regardless, this exercise is important for me



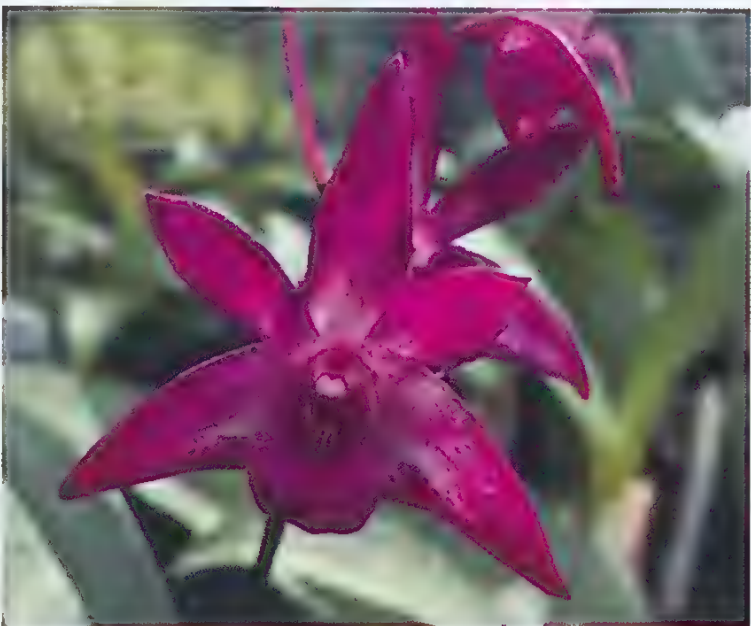
Dendrobium Don't Forget 'Genesis'. Photo C. Farrell



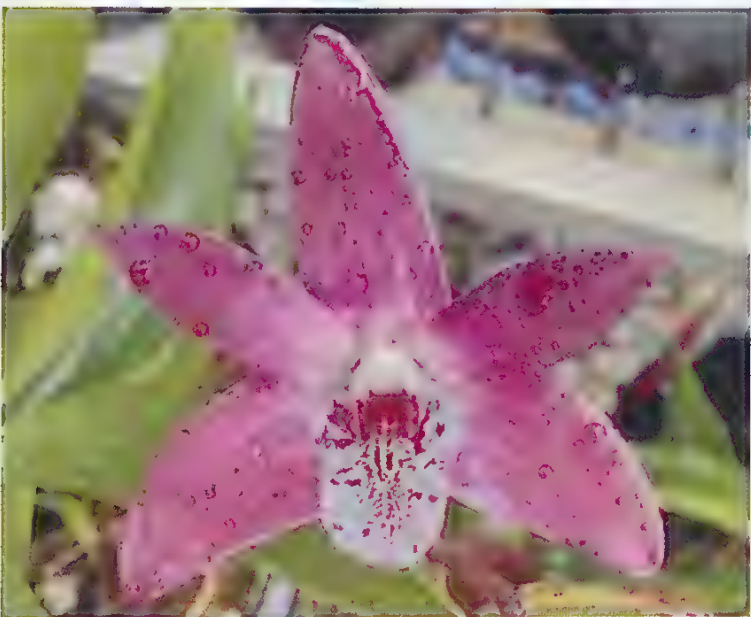
Dendrobium Hunter Harlequin 'Birthday'.
Photo and Plant J. Cutajar



Dendrobium Hunter Bullion 'Genesis'. Photo C. Farrell



Dendrobium Hunter Cracker. Photo C. Farrell



Dendrobium Hunter Doadstar. Photo and Plant S. Howard



Dendrobium Hunter Crash. Photo C. Farrell

as a breeder and a grower, and further, the activity is enjoyable and useful.

Predictions and Early Results - 2016 Catalogue

***Dendrobium* Don't Forget (remake)**

D. Burgundy Bride 'Dell' x *D. speciosum* var. *curvicaule* 'Daylight Moon' FCC/AOC

Prediction: Several plants of the same cross flowered around the country, with *D. Burgundy Bride* primarily having a bold burgundy labellum matched by maroon patterning on the segments. It was predicted that 'Daylight Moon' would aid in producing plants with good shape, colour, and flower count.

Outcome: Shapely flowers of deep red colour, on a highly floriferous inflorescence. The flower colour has ranged from white to yellow and from pink to red. We have flowered around 15 plants of this cross so far. I feel confident that this cross has produced plants from good to high quality and have also observed many of the cross flowered by customers and these are in the same range of quality.

***Dendrobium* Hunter Bullion**

D. Hunter Titanium 'Jazzy' x *D. Dunokayla* 'Agro'

Prediction: *Dendrobium* Hunter Titanium 'Jazzy' is a sizeable and substantial flower with broad segments and red patterning. *Dendrobium* Dunokayla 'Agro' is alike but with no patterning, typical of the grex. Cream and yellow flowers were predicted with subtle red markings, and good substance and texture.

Outcome: Cream and yellow flowers have been produced without outstanding shape and texture. Subtle red markings have been present in several examples. In contrast, yellow flowers with no markings have also been produced. We have flowered ten plants of this cross, and all have been retained. Those flowered by others have also remained in personal collections. As these plants mature, we are likely to observe improvements, with the possibility of some reaching excellent quality.

***Dendrobium* Hunter Cracker**

D. Gillieston Jazz 'Fishing Point' x *D. Cracker* 'Kay'

Prediction: *Dendrobium* Gillieston Jazz 'Fishing Point' is a starry hybrid with violet purple patterning and a matching labellum. It was crossed with *D. Cracker* 'Kay' to hopefully produce flowers with wide labellums, attractive patterns, intense colours, and large flowers in the style of *D. Brinawa Charm*.

Outcome: Intensely coloured flowers comparable to *D. Brinawa Charm* were produced, however

patterning was more block-like when compared to striations. Labellums were widened due to the increased percentage of *D. kingianum* in this grex. However, flower size was reduced when compared to the pod parent. We have flowered a large number of this cross. Seedlings have ranged from average to good quality. It is doubtful whether any seedlings from this cross will be awarded, but they will create attractive 'pot plant' specimens in many collections.

***Dendrobium* Hunter Crash**

D. Gillieston Jazz 'Fishing Point' x *D. speciosum* var. *curvicaule* 'Daylight Moon' FCC/AOC

Prediction: *Dendrobium* Gillieston Jazz 'Fishing Point' is a starry hybrid with violet purple patterning and a matching labellum. It was crossed with 'Daylight Moon' to hopefully increase the flower count and increase the width of the segments while maintaining the vibrant colours of the pod parent.

Outcome: The segments produced were somewhat broader. This cross has been highly variable regarding colour and shape. Most flower colours have been more pastel than vibrant. At least ten seedlings flowered in our collection, and several flowered by others have expressed these qualities.

***Dendrobium* Hunter Doadstar**

D. Doadstar 'Tumbi' x *D. Dunokayla* 'Palemoon'

Prediction: *Dendrobium* Doadstar 'Tumbi' is a purple hybrid with above-average substance and texture. I predicted there would be substance-dominated flowers of purple shades on long arching racemes.

Outcome: Substantial flowers of purple shades were successfully produced. It will be some years before the habit of the inflorescence is well known. These preliminary outcomes are based on only five or so plants, so the comments on substance and colour may not generalise.

***Dendrobium* Hunter Harlequin**

D. Elegant Heart 'Harlequin' x *D. Dunokayla* 'Moonlight'

Prediction: I considered that this cross would be the future of *Tropicool™ breeding and hoped for substantial flowers with intense colour.

Outcome: While this outcome has not been achieved to date, quality cream and yellow flowers with pleasing shapes have been produced. I have seen and flowered around 20 plants of this cross, and while they have all been of consistently good quality, none have as yet demonstrated robust and vibrant colouration.



Dendrobium Hunter Horizon. Photo C. Farrell



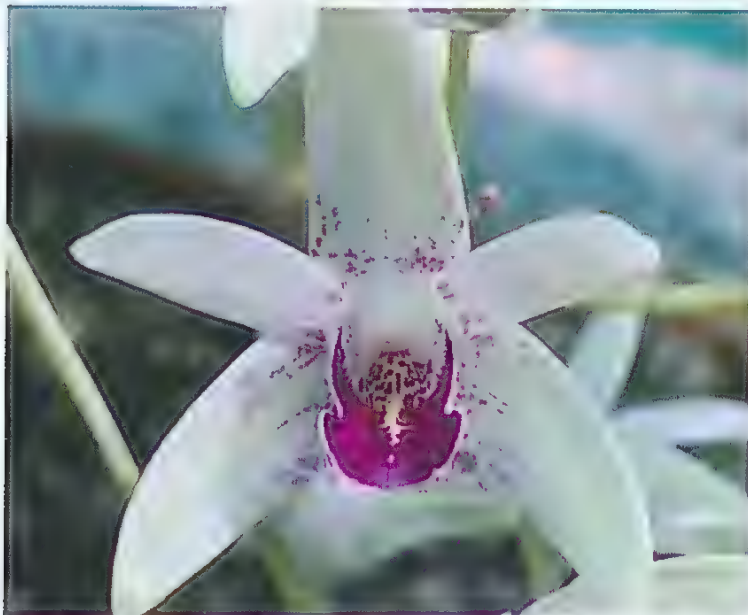
Dendrobium Hunter Intent.
Photo and Plant Kings Nursery



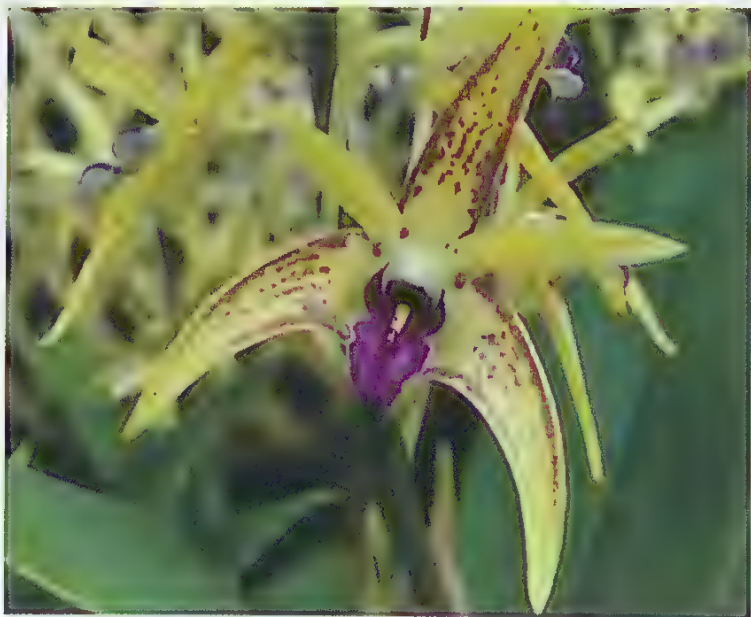
Dendrobium Hunter Pride. Photo and Plant G. Oehm



Dendrobium Hunter Quest.
Photo and Plant Kings Nursery



Dendrobium Hunter Sparkle. Photo and Plant N. Watts



Dendrobium Lisa Turner. Photo C. Farrell

***Dendrobium* Hunter Horizon**

D. Tweetas 'That's Gold' x *D. Weatherly* 'Michael'
Prediction: I predicted shapely flowers of purple and sunset tones and hoped to increase the substance of *D. Weatherly* 'Michael' while maintaining heavy colouration.

Outcome: Substance was increased, and flower size was somewhat reduced by *D. Tweetas*. The cross has produced simple yellows and many plants with large amounts of brown markings as an overlay to the yellow base. Many seedlings have continued to improve with subsequent flowering. These comments are likely to generalise well, as they are based on a substantial sample population.

***Dendrobium* Hunter Intent**

D. Intice 'Bob' x *D. speciosum* var. *curvicaule* 'Daylight Moon' FCC/AOC

Prediction: I predicted flowers in the style of *D. Australian Artist* style from this cross. Further, that it would produce compact plants with a large display of spring colour.

Outcome: Good colour has been produced, and there are similarities to *D. Australian Artist*. However, the reduced percentage of *Den. kingianum* has led to a narrowing of the segments in the pictured example.

***Dendrobium* Hunter Pride**

D. Saigon Victory 'Genesis' x *D. speciosum* var. *curvicaule* 'Daylight Moon' FCC/AOC

Prediction: I predicted that shapely flowers of mixed red and brown tones would be produced, similar to *D. Memoria Brian Gerhard*.

Outcome: Sunset tones and anticipated red and brown colours that were not predicted. Early indications representing five plants are promising, even considering the pinched labellum of the presented example.

***Dendrobium* Hunter Quest**

D. Brian's Quest 'Genesis' x *D. Dunokayla*

Prediction: Expected splashes of colour on broad, fleshy segments, similar to *D. Dunokayla*.

Outcome: Results have usually been in line with the expectations. One example opened a green colour with a purple tinge, setting as a cream with purple-spotted labellum. I have flowered many plants of this cross, up to 30, and most have been of average quality. In contrast, as pictured, there have been exceptions with good quality.

***Dendrobium* Hunter Sparkle**

D. Candice 'Yellow/Purple' x *D. Dunokayla*

'Moonlight'

Prediction: I expected high flower counts and thicker segments than that offered by *D. Candice* 'Yellow/Purple', and easily grown plants.

Outcome: Segments were increased with regards to width. Most examples of this cross have shown a colourful and, at times; contrasting labellum, making the grex attractive. I have seen over 50 examples so far. Collectors are likely to retain this cross due to plants being easily cultivated and highly floriferous.

***Dendrobium* Lisa Turner (remake)**

D. Zip 'JMCM' x *D. speciosum* 'Maddison' AM/ANOS-AOC

Prediction: *Dendrobium Zip* 'JMCM' is an attractive plant with crowds of colourful flowers. I was hopeful that *D. speciosum* 'Maddison' would add strength to the inflorescences so that the flowers would appear well above the foliage. Modest flower size, texture and flower count without losing the intensity of colour were expected.

Outcome: Intense colours were retained in some examples of this grex. However, in the majority of examples, colour was washed out. This cross is yet to produce excellent results. It is attractive, and easily grown plants were produced. This is an example of how experimental breeding can produce attractive pot plants for the general orchid grower.

***Dendrobium* Memoria Brian Gerhard (remake)**

D. Saigon 'Don' x *D. speciosum* var. *curvicaule* 'Daylight Moon' FCC/AOC

Prediction: Expected large blooms of colours ranging from purple to earthy browns, with wide labellums and above-average texture.

Outcome: These seedlings have proved to be somewhat slow growers. They have produced purples, pinks, sunset tones, and earthy browns. Above-average texture and several attractive labellums have been noted. It would be interesting to remake this cross with several other varieties of *D. speciosum* to investigate the effect these have on colour, shape, and ease of cultivation.

***Dendrobium* Wickersham (remake)**

D. Australian Ginger 'Meggs' x *D. Lauren* 'Holly Chief' AM/AOC, HCC/ANOS

Prediction: Expected large flowers of yellow,



Dendrobium Memoria Brian Gerhard.
Photo and Plant G. Oehm



Dendrobium Wickersham 'Genesis'. Photo C. Farrell



Dendrobium Hunter Galah. Photo and Photo G. Oehm



Dendrobium Wickersham. Photo C. Farrell



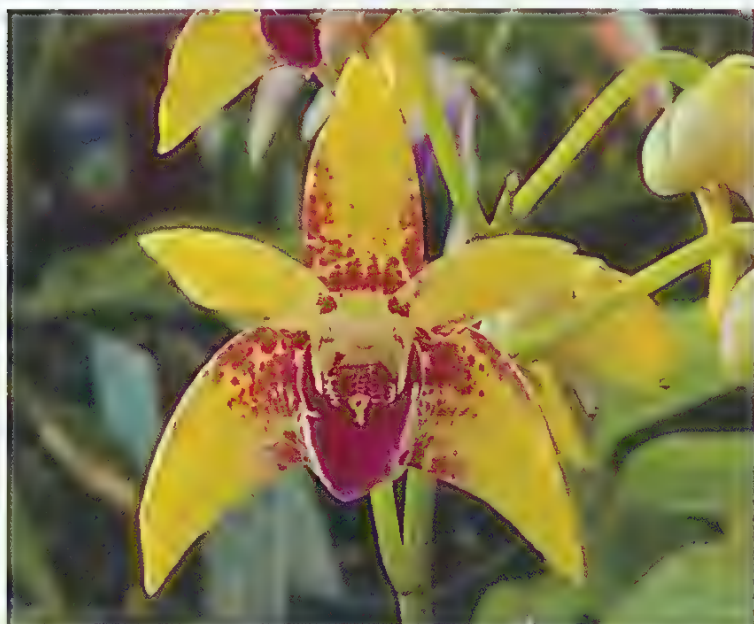
Dendrobium Hunter Babylon. Photo and Plant R. Reitano



Dendrobium Hunter Semillon. Photo D. Hemmings



Dendrobium Hunter Semillon. Photo D. Hemmings



Dendrobium Hunter Gypsy. Photo and Plant G. Oehm



Dendrobium Hunter Sine. Photo R. Lewry

green and olive tones from this cross, with long colourful labellums.

Outcome: Examples have been produced with yellow, green and olive tones and red/purple labellums, typical of this *D. teretifolium* influenced line of breeding. We have retained around 20 plants of this cross, all of outstanding quality. I consider the grex will prove useful both in exhibition and, more importantly, in future hybridisation.

Predictions and Early Results 2018 Catalogue

Dendrobium Hunter Babylon

D. Tweetie 'Pie' x *D. Martin* 'Gold' HCC/AOC-ANOS

Prediction: *Dendrobium* Martin 'Gold' presents with

good shape and a green/gold colouration. Using *D. Tweetie* 'Pie' as the pod parent, there could be different colouration combinations. *Dendrobium* Tweetie offered the possibility of several flowerings a year.

Outcome: Different colour tones have not yet been produced. Yellow coloured flowers with vibrant and attractive markings have been the most common outcome. The labellum shape was improved. I am yet to observe several flowerings throughout the year from a single plant. These observations may be generalised, with several more examples flowered in spring 2021.

***Dendrobium* Hunter Galah**

D. Jonathan's Glory 'Dark Joy' HCC-AD/AOC x *D. Zip* 'JMCM'

Prediction: Compact plants with flowers heavily influenced by *D. kingianum* were expected. More specifically, pink flowers with striped markings.

Outcome: Pink flowers have been produced on compact plants. The striped markings of *D. Zip* have not presented themselves thus far. Regardless, these plants will give joy to growers in spring each year. The preliminary outcomes represent only two plants.

***Dendrobium* Hunter Gypsy**

D. Burgundy Bride 'Dell' x *D. Hunter Titanium* 'Jazzy'

Prediction: *Dendrobium* Burgundy Bride 'Dell' has a bold burgundy labellum matched by maroon patterning on the segments, and the labellum seems to carry through into progeny. I used it as the pod parent for a *D. Kayla* style hybrid and expected yellow flowers with red labellums and/or darker red markings on other flower segments.

Outcome: Yellow and gold flowers with dark red labellums have been observed. Substance and shape have been improved, based on a small sample. These features have been seen consistently.

***Dendrobium* Hunter Semillon**

D. Hunter Dream x *D. Hunter Titanium* 'Jazzy'

Prediction: There were no particular expectations, but there was a hope that these would offer an alternative to *D. speciosum* shaped hybrids and that the grex would have a variable amount of colourful markings on the flower segments.

Outcome: Positive shape, colour, segment balance, and texture have been observed. An attractive attribute is the faint red stripe on the outer parts of the segments. These outcomes are based on only ten or so examples. They have inspired the use of *D. Hunter Titanium* 'Jazzy' in another set of crosses in spring 2021.

***Dendrobium* Hunter Sine**

D. Harmon 'Mark' x *D. Hot Coals*

Prediction: *Dendrobium* Harmon is a relatively large-flowered *Dendrobium*. It has white striations and is about 30mm wide. It forms a very compact plant, and the inflorescences are completely upright.

Dendrobium Hot Coals was used to produce open brown/red coloured flowers with high flower counts.

Outcome: Brown and red colourations have been observed. The cross also seems to produce a high flower count. Striated markings have added a pleasing

contrast and I am excited by the preliminary results. While these plants may be of average or above-average quality, they are likely to be cornerstones for future hybridisation.

Acknowledgements

Thank you to all our customers and friends over the years for their support and, and in particular the people who made this observational paper possible: Carole Barnett, Jody Cutajar, David Hemmings, Steve Howard, Hao Nam, Robert Lewry, George Oehm, Robert Reitano and Nicholas Watts.

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Callyn Farrell is an ANOS and AOC judge. He is the co-owner of Down Under Native Orchids with Grahame Young, specialising in breeding several sections of Dendrobium.

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Dendrobium bigibbum var. *superbum* (Rchb.f. ex W. Watson) Peter B. Adams 'Tozer Stripe'

Text Col Andrews and Lawrie Green | andrews_68a@yahoo.com

Summary

This story is about an unusual orchid, Australian *Dendrobium bigibbum* var. *superbum* 'Tozer Stripe', from its chance discovery in Far North Queensland to limited breeding successes.

Introduction

A group of orchid plants were rescued between Coen and Weipa in far north Queensland around the time the power lines were installed in the 1960s. When the plants flowered one *Dendrobium* plant stood out, as the flowers were quite distinct with dark pink/purple stripes on pale pink segments. This plant was named 'Tozer Stripe' and it was considered to be a form of *Dendrobium bigibbum* var. *superbum*. Due to the name, some people spent quite a lot of time looking around Mt. Tozer on the east coast, north of Lockhart River, in an endeavour to find similar plants.

(Editor's Note: the stripes are the normal veins in the sepals and petals which are a very deep purple and on a pale background, in this form, hence they appear as stripes.)

Neil asked Dr Peter Lavarack to examine the plant of 'Tozer Stripe' because the striping on the flowers was so unusual. He completed the review and forwarded his findings to Neil. I have included the statement made by Dr Lavarack in the letter, signed and dated 20 March 1997:

To whom it may concern

I have studied the plant shown to me by Neil Crees known as 'Tozer Stripe'. It is, in my opinion, a normal Cooktown orchid (Dendrobium bigibbum variety superbum) in all respects except for the unusual striping of the petals and sepals.

Yours faithfully

P.S. Lavarack (Botanist)

Northern Regional Centre

History of Breeding

Lawrie Green and his friends Neil Crees and Ray 'Curly' Nichols undertook a breeding program that started with 'Tozer Stripe'. Quite a few generations were line bred from 'Tozer Stripe' and the stripes were retained in the progeny, with some flowers having improved shape and texture. Some progeny showed variations in flower colour, from pink to darker purple stripes on very pale to darker pink segments. Some of the seedlings were free-flowering and strong growers, while others were not quite so cooperative.

In 2007 Lawrie gave me a flask of each of four sibling crosses he had made between 2004 and 2006 with seedlings from the selfing of 'Tozer Stripe'. I had some challenges growing these plants on the far north coast of New South Wales, with only 14 plants surviving to flower. The reward for me was that all of the seedlings produced striped flowers - some were pale and others were darker. Several plants had 10–12 flowers on a raceme. The crosses were:

1. Cross 10–04 ('Stripe 502' x 'Finnigan's Stripe'). One seedling, 'Melville Stripe', survived.
2. Cross 35–05 ('Stripe Broad Lip' x 'Dark Stripe Red Lip'). One seedling, 'Coen Stripe', survived.
3. Cross 49–05 ('Surprise Stripe' x 'Super Stripe'). Nine seedlings survived, named after rivers of the Cape, and several are illustrated. Others from this cross included 'Carbine Stripe', 'Lockhart Stripe', 'Jackson Stripe' and 'Endeavour Stripe'.
4. Cross 05–06 ('Stripe 610' x 'Curly 2006'). Three seedlings survived - 'Princess Stripe' (illustrated), 'Charlotte Stripe' and 'Coral Stripe'.



Dendrobium bigibbum var. *superbum* 'Tozer Stripe'.
Photo L. Green



Dendrobium bigibbum var. *superbum* 'Archer Stripe'.
Photo C. Andrews



Dendrobium bigibbum var. *superbum* 'Daintree Stripe'.
Photo C. Andrews



Dendrobium bigibbum var. *superbum* 'Jardine Stripe'.
Photo C. Andrews



Dendrobium bigibbum var. *superbum* 'Mitchell Stripe'.
Photo C. Andrews



Dendrobium bigibbum var. *superbum* 'Princess Stripe'.
Photo C. Andrews



Dendrobium bigibbum var. *superbum* 'Mulgrave Stripe'.
Photo C. Andrews

In 2012 Lawrie moved from the Atherton Tablelands in far north Queensland to south-east Queensland. The move took much longer than anticipated and sadly very few of his *D. bigibbum* plants survived. The plants that I have are the remnants of the extensive breeding program that Lawrie, Neil and Curlie had undertaken.

Conclusion

Growing striped *Dendrobium bigibbum* var. *superbum* on the far north coast of New South Wales has had many challenges, the least of which is keeping the plants alive, especially during winter. During the last 5–6 years several of the plants mentioned above have really struggled, and some have perished.

I understand that several pieces of the original *D. bigibbum* var. *superbum* 'Tozer Stripe' have survived in collections. Unfortunately, I don't have a piece of the original plant, but I understand that there are challenges in growing and flowering it successfully, which I can attest to, as this trait has been passed on to its progeny.

Colin is an experienced grower on the Far North Coast of New South Wales. Lawrie is an experienced grower in the Lockyer Valley region of Queensland.



Australasian Native Orchid Society Inc.

Established 1963

Welcome to ANOS Inc.

The Australasian Native Orchid Society Inc. is the major organisation promoting the understanding and appreciation of orchids growing naturally in our region of the world – Australia, New Zealand, New Guinea and the adjacent western Pacific.

We focus on a number of areas including conservation, research, breeding of species and hybrids in culture.

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Colour Variations in *Dendrobium rigidum* R.Br.

Text by David James | davidljames@bigpond.com

Summary

The tropical species *Dendrobium rigidum* (section *Rhizobium*) from northeastern Australia and New Guinea exhibits variation in floral colour, usually with pale cream-yellow tepals and a labellum with variable amounts of red-purple. It grows best as a mounted plant in tropical, subtropical and warm temperate conditions.

Introduction

Flower colour (sepals and petals), labellum colour and labellum markings of the flowers of *Dendrobium rigidum* are highly variable and a representation of the species variability is a good addition to any collection. Unfortunately, there is little commercial propagation of the species, so it is not widely available.

Description

Dendrobium rigidum was among the earliest of the Australian species in the genus *Dendrobium* to be described. It was discovered by Solander near the Endeavour River, North Queensland, in 1770 and Solander's original sketch is in the British Museum. It was described by Robert Brown in 1810 in *Prodromus Florae Novae Hollandiae et Insulae van Diemen*. The name comes from 'rigidus' which means stiff or hard and is in reference to the leaves.

Plants have numerous, branching, pendulous wiry stems. In large plants, the stems can be up to 40 cm long. The leaves are thickened with a pointed tip, and the surface is generally rough. Sometimes they are slightly hollowed towards the centre of the leaf, and they are typically curved with one edge being shorter than the other (Adams 2015). In some cases, they can be almost cylindrical with parallel sides. Upton (1989) indicates they are mostly grey-green in colour, but they are frequently spotted with red or purple. I have noted that if the plants are growing in high light conditions the leaf colour can vary from pale red to brownish green.

The inflorescences are 2–5 cm long with up to seven fragrant flowers. These flowers are sometimes quite crowded on the inflorescence and are variously oriented rather than non-resupinate. The flowers are 10–20 mm across the lateral sepals (Upton 1989). The flowers generally do not open widely, however, on some plants the flowers can open widely. They last from 10–14 days in Australian conditions but in New Guinea, they last only 3–4 days (O'Byrne 1994).

The flowers are variable in size, colour and markings on the labellum and side lobes. In Australian forms, the colour and markings on the labellum are typically cream, with a yellow labellum with solid red markings (outline) and side-lobes. The colour of the dorsal sepal, lateral sepals and petals can vary from white, cream, yellow, apricot, green and pink to bronze. The base colour of the labellum varies from white, cream, pale yellow to yellow. The markings on the labellum and side-lobes can vary from red to red-purple. These markings can vary from solid to stripes, streaks, flecks, and spots, or there may be limited markings except on the side-lobes.

Dendrobium rigidum can flower at any time of the year, but the peak flowering time is in spring.

Taxonomy

According to the World Checklist of Selected Plant Families (WSCP), *Dendrobium rigidum* has four synonyms. The homotypic synonyms are:

Callista rigida (R.Br.) Kuntze 1891

Dockrillia rigida (R.Br.) Rauschert 1983



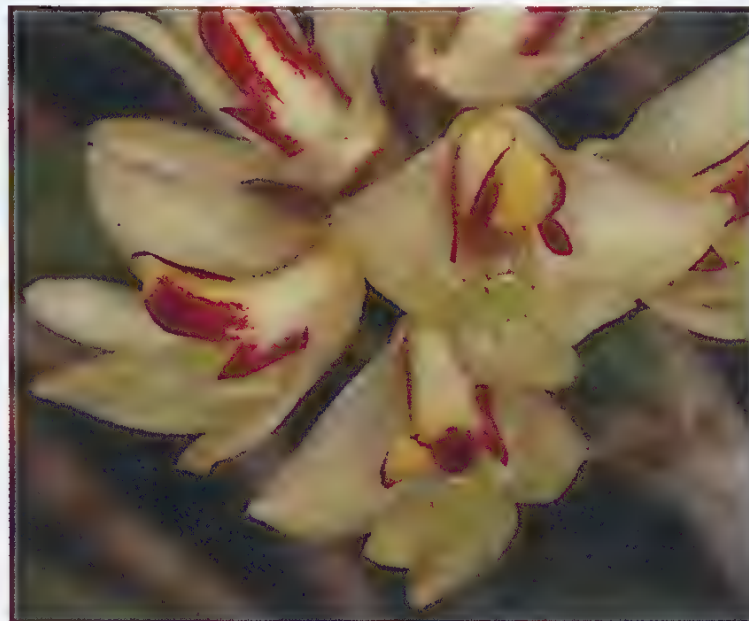
Dendrobium rigidum ex Papua New Guinea.
Photo A. Schuiteman



Dendrobium rigidum 'Hopevale'. Photo P. Adams



Dendrobium rigidum. Photo G. Corbin



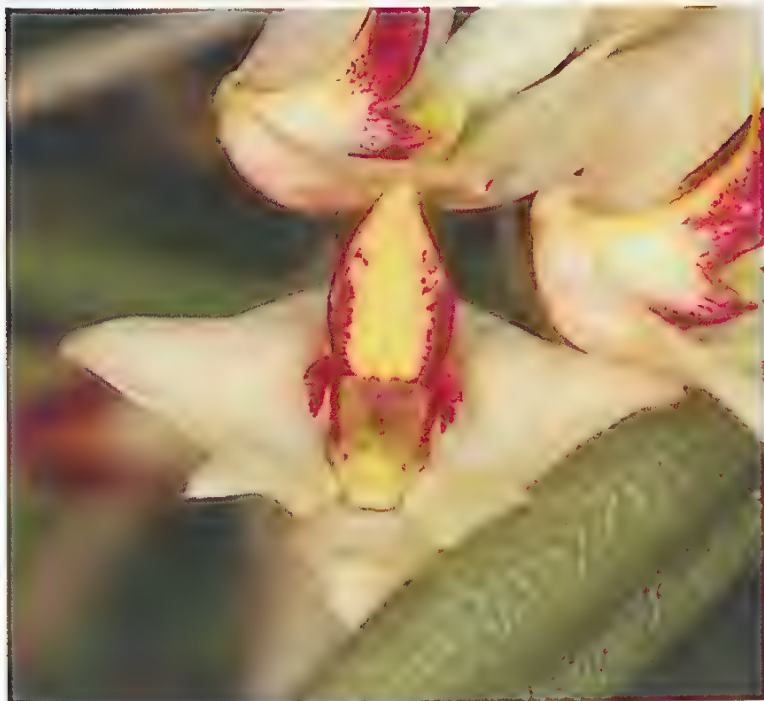
Dendrobium rigidum. Photo J. Cara



Dendrobium rigidum. Photo J. Cara



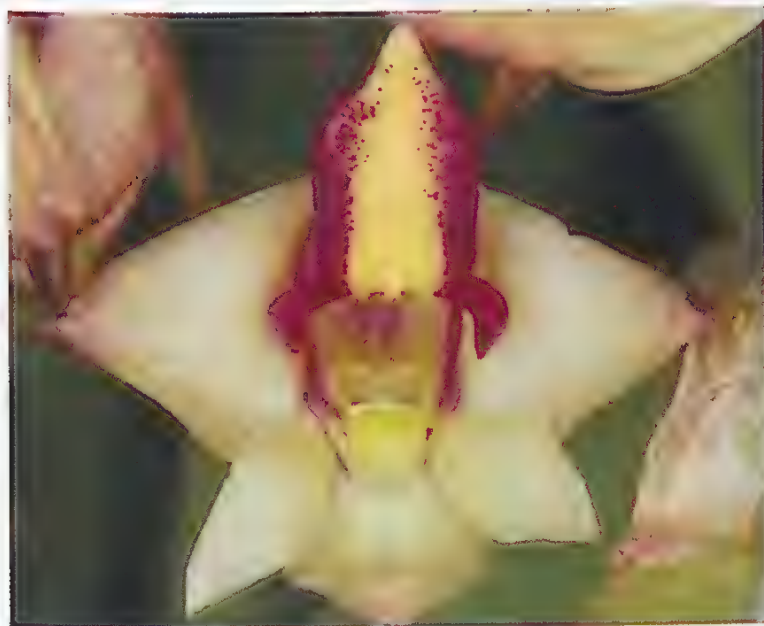
Dendrobium rigidum. Photo J. Cara



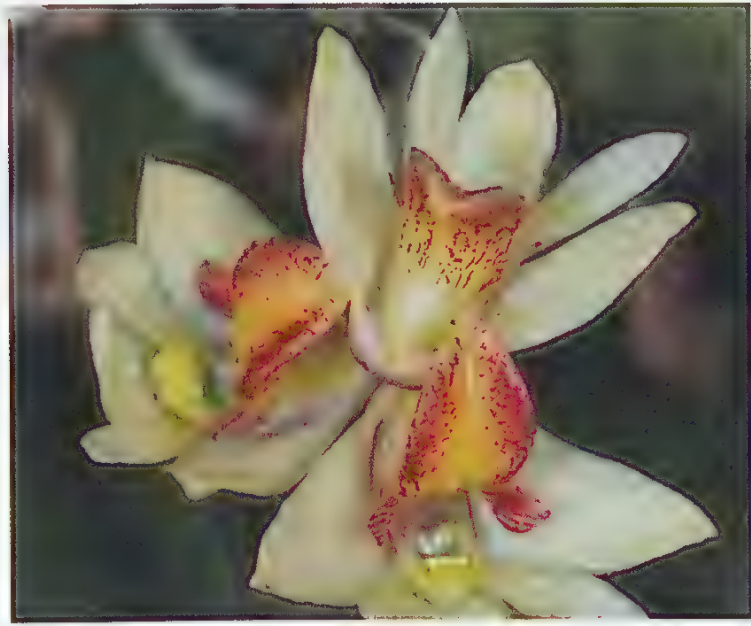
Dendrobium rigidum. Photo J. Cara



Dendrobium rigidum. Photo G. Corbin



Dendrobium rigidum. Photo J. Cara



Dendrobium rigidum 'Jardine River' ACC/ANOS 2019.
Photo G. Corbin



Dendrobium rigidum. Photo G. Corbin



Dendrobium rigidum. Photo G. Corbin

The heterotypic synonyms are:

Dendrobium desmotrichoides J.J.Sm. 1908

Dockrillia desmotrichoides (J.J.Sm.)
Brieger in F.R.R.Schlechter 1981

Homotypic names have a different genus but the same specific epithet (name) remembering that *rigidum* and *rigida* are the same because the change in the spelling of the ending of the names relates to the gender of the genus. Heterotypic synonyms have different specific epithets. They can be the same genus or a different genus.

Distribution

Dendrobium rigidum grows from eastern tropical Australia to New Guinea. In Australia, it occurs from about the Russell River (the river mouth is halfway between Innisfail and Cairns) to the tip of Cape York Peninsula and also on some of the islands in the Torres Strait. It occurs in the coastal plain and adjacent foothill areas of the island of New Guinea from the Merauke Regency of Papua to the Morobe Province of Papua New Guinea (Howcroft 1978). It is also native to the Aru Islands in the Arafura Sea about 800 km NNE of Darwin (Schuiteman 2013).

Habitat

The natural habitat for *Dendrobium rigidum* is wide-ranging. It occurs in coastal swamps and ranges. In the coastal swamps, it grows on mangroves, and this is probably where it is most common. The low ranges where it grows can sometimes be a long way from the coast. It can be found on rainforest trees and hoop pine (*Araucaria cunninghamii*). It typically grows in bright light situations with good air movement and appears to be tolerant of very dry conditions. It is abundant on trees along the many creeks in the northern part of Cape York Peninsula.

Culture

Dendrobium rigidum can be grown and flowered successfully in bush-house conditions in tropical, subtropical and northern temperate regions of Australia. In warmer temperate regions it is happiest in a semi-shaded position in a warm greenhouse during the winter. I do not think it would appreciate being frosted. It grows well on slabs of cork or hardwood if frequently misted in the hot summer months and kept just moist the rest of the year. If

grown in pots it should be allowed to dry out between watering events as it does not like having ‘wet feet’, especially in cooler conditions.

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David James is the ANOS Inc. Regional Registrar for the Northern Region (Queensland and far north coast of New South Wales) and has a keen interest in the variation of colour and form of flowers within a species.

Sarcochilus hirticalcar (Dockrill) M.A.Clem. & B.J.Wallace and its Hybrids

Text Gianni Montalto | Photos Roslyn Capell | giannimontalto@gmail.com

Summary

Sarcochilus hirticalcar is commonly called the harlequin orchid. It is one of about 20 species in the genus, and part of the broader subtribe *Aeridinae* within Tribe Vandeae.

It was first described by Alick Dockrill in 1967. Up to December 2019 there were 202 hybrids registered with *S. hirticalcar* in their background, including intergenerics. In the following 18 months to June 2021 a further 22 *S. hirticalcar* hybrids, including two intergenerics, were registered. *Sarcochilus hirticalcar* influences its progeny by extension of flowering times, and has colours which are usually yellow, orange and red, with heavy floral substance.

Introduction

Sarcochilus hirticalcar is a fairly recent discovery and there are few detailed studies. It is best known through the growing number of available hybrids. It was first described in 1967 as *Parasarcochilus hirticalcar* Dockrill and later recombined as *Pteroceras hirticalcar* (Dockrill) Garay in 1972. These are regarded as homotypic synonyms by the World Checklist of Selected Plant Families at Kew. In 1998 Mark Clements and Ben Wallace proposed another recombination as *Sarcochilus hirticalcar* M.A.Clem. & B.J.Wallace in the genus *Sarcochilus* R.Br.. This name was formally accepted by Kew in 2003. This article examines the hybrids, identifies some important ones, and some observations are made of the awarded hybrids.

Distribution and Habitat

Sarcochilus hirticalcar is endemic to the McIlwraith Range, a granite plateau on Cape

York Peninsula in far north Queensland, 550 km north of Cairns, and 15 km east of Coen. The range is part of the Great Dividing Range and is moderately elevated, reaching 824 m asl as it extends to its most northerly reach.

The McIlwraith Range is covered by the protected Kulla National Park and is part of the Kaanju indigenous language region. Located about halfway between the southern coast of Papua New Guinea (PNG) and Cairns, it is not surprising that the tropical habitat is more like that of PNG than habitats across most of Australia. The area is also the southern limit of some other northern and PNG plant and animal species.

The vegetation is monsoonal rainforest, but drier than the wet tropical rainforest on the eastern side of Cape York. The area receives about 1,500ml of rain annually and is the source of the Archer River which flows westerly into the Gulf of Carpentaria, and the Stewart River which flows easterly into the Coral Sea.

The distribution is small and localised to suitable habitat 300–600 m asl. At the higher altitude, average temperatures on the plateau are a few degrees cooler than most other areas of Cape York, which has average monthly highs between 30.9° C late in the year, and 27.6° C mid-year. Average monthly lows range from 24.2° C late in the year to 21.5° C mid-year (Australian Bureau of Meteorology).

Description

The Latin words '*hirtus*' and '*calcar*' translate to hairy spur. See Upton's illustration (1992) which depicts that the inside of the spur hollow is hairy.



Sarcophilus Duno Nickys Twin 'Voo Doo' HCC-AD/
ANOS 2003; AM-AD/AOS 2007



Sarcophilus Evening Star
(*S. Galaxy* x *S. Duno Nickys Twin*)



Sarcophilus Fiery Twin
(*S. Fiery Glow* x *S. Duno Nickys Twin*)



Sarcophilus Joy x *Sarcophilus* Hargitay
(*S. Hargitay* is *S. Riverdene* x *S. Velvet*)



Sarcophilus Intense
(*S. Magenta* x *S. Duno Nickys Twin*)



Sarcophilus Allure
(*S. Duno Nickys Twin* x *S. Elegance*)



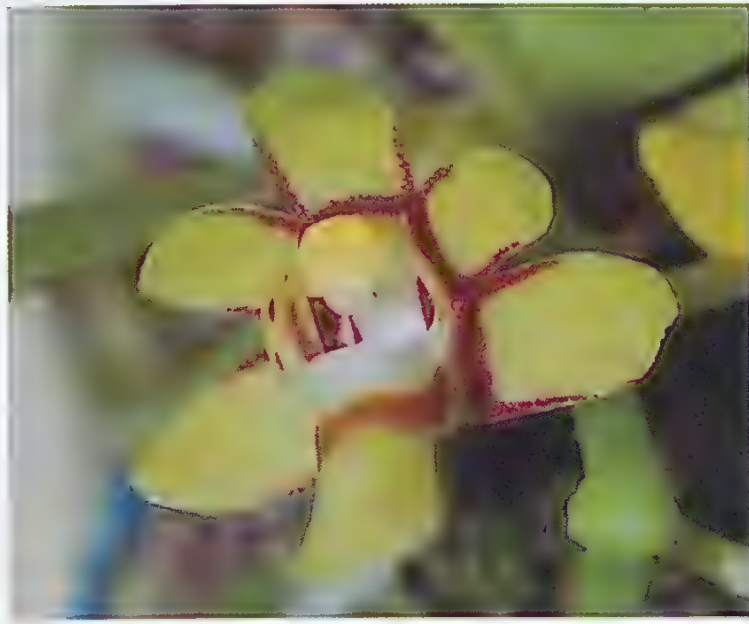
Sarcophilus Cindy 'Purple Rain'
(*S. Elise* x *S. Velvet*)



Sarcophilus Elise 'Plum'
(*S. ceciliae* x *S. Nicky*)



Sarcophilus Galaxy 'Cream 2011'
(*S. Misty* x *S. hartmannii*)



Sarcophilus hirticalcar



Sarcophilus Magic 'Macros' AM/AOC 2015 (NSW)
(*S. Duno Nickys Twin* x *S. Zoe*)



Sarcophilus Misty's Twin
(*S. Misty* x *S. Duno Nicky's Twin*)

Plants are often found on mossy tree trunks along rivers and creeks, preferring cool to warm, moist locations. The growth habit is monopodial, vandaceous, and the growing tip typically hangs lowest. The roots ramble on the mount surface in all directions, following water run-off and the dissolved nutrients it contains. It supports up to 6–8 leaves if growing well, but often less.

The stiff flower stem is about 40–100 mm long, arches downwards, and has up to 10–12 flowers if growing exceptionally well. Flowers are about 8 mm wide, and colour can range from cream to bright yellow background, with red/brown bands on the tepal edges, especially where they join the column. The prominent labellum is yellow with irregular brown to orange markings.

Culture and Flowering

Flowering time in far north Queensland is in the early hot and wet season from October to December, presumably when insect pollinators are most active. Flowers tend to open semi-sequentially over a long time, meaning three or four flowers tend to be open at a time. The pollinator is unknown.

In cultivation in temperate areas, the flowering season can be extended by shielding plants from cold extremes of winter and early sharp temperature changes in the heat of summer, while providing sufficient humidity. The racemes can then develop to their best potential, well beyond early summer, with a more gradual shift from drier/cold to wetter/warm conditions, mimicking long warm humid summers.

In Melbourne, Victoria, flowers emerge on quite young plants within a year or two of deflasking, provided there is strong root growth. I grow plants inside my home, close to a shaded west-facing window in a room with no heating or cooling where temperatures can range from 5–30° C across the year. Plants appear to favour elevated ambient humidity in warmer temperatures but can tolerate drier conditions in cooler seasons. Water is applied by hand spray

along with weak dissolved fertiliser so that the host mount is never dry for longer than a day. Most leaf and root growth are made in spring and autumn, at temperatures between 20–25 °C. When temperatures are outside that range, growth slows noticeably, and root tips harden over. However, flowers can emerge throughout the warmer months from November to March.

In external shade and greenhouses, similar care is needed in maintaining temperature in the range of 20–25° C for longer periods, while sustaining and increasing ambient moisture when the temperature is warmest, which would certainly encourage healthy growth and extend flower timing.

Hybridisation

The most desirable aspects of the species for hybridising include:

- Yellow and red colour in flowers
- Compact plants
- Extended flowering seasons over warmer months when other *Sarcochilus* species and hybrids have ceased flowering
- Heavy texture in flowers and apparent resistance to *Botrytis*, not surprising that it has evolved in a cooler and higher altitude habitat than a typical wet tropical habitat
- Flowering on young plants, meaning that breeding can happen more quickly or easily over successive generations

Less attractive traits include:

- Reluctance to form side growths, which help to renew roots close to the host mount. Mature plants with failing older roots more easily lose grip on their mount
- Relatively short longevity in cultivation, perhaps the reluctance to form side growths is a factor

By introducing one or more of the positive attributes into breeding lines with favourable aspects of other *Sarcochilus*, new possibilities

	<i>Sarcochilus hirticalcar</i> Hybrid Generations					TOTAL
	B	C	D	E	F	
Registered hybrids	18	26	86	50	22	202
Awarded hybrids	1	7	28	8	4	48
Awards	2	30	135	22	6	195

Table 1. *Sarcochilus hirticalcar* hybrids, registrations and awards to December 2019.

can be achieved for both hobbyists and commercial growers. Though assessing success in this endeavour can be a subjective pursuit, this article sets objective criteria for measuring success. Firstly, it considers a large number of registered progeny (20 or more), which suggests easy breeding, and that the breeder recognised one or more desirable and reliable features which could be passed onto the offspring. Secondly, the fact that the progeny have received one or more awards, indicating favourable assessment according to the ANOS Inc. judging standards or the guidelines applied by other award judging systems.

Sarcochilus hirticalcar Hybrids

The first hybrid was *Sarcochilus* Riverdene (*S. hartmannii* x *S. hirticalcar*), originated by V. & N. Jupp and registered by them in 1976.

Between 2000 and December 2019 there were 202 hybrid registrations involving *S. hirticalcar*. The species was a direct parent of 18 registered hybrids with six being primary hybrids (Table 1, Generation B). Of the 184 other registered hybrids with *Sarco. hirticalcar* in their background, six are intergeneric hybrids: four *Plectochilus*, all involving *Plectorrhiza tridentata*, one *Peristerchilus* involving *Peristeranthus hillii* and one *Aeridochilus* involving the Indian species *Aerides crispera* (Table 1, Generations C to F). Since January 2020, a further 22 *Sarcochilus* hybrids have been registered involving *S. hirticalcar*, including two more *Plectochilus*.

Awards

The first hybrid awarded was *S. Polka-Dot* (*S. Pinkhart* x *S. hirticalcar*) in 1994, achieving

Hybrid	Parents	Generation	Background <i>Sarcochilus</i> species	Awards including progeny
<i>S. Velvet</i>	<i>S. Riverdene</i> <i>S. Nicky</i>	C	50% <i>hirticalcar</i> 25% <i>hartmannii</i> 25% <i>fitzgeraldii</i>	37
<i>S. Duno Nicky’s Twin</i>	<i>S. Nicky</i> <i>S. Fitzhart</i>	C	50% <i>fitzgeraldii</i> 25% <i>hartmannii</i> 25% <i>hirticalcar</i>	105
<i>S. Galaxy</i>	<i>S. Misty</i> <i>S. hartmannii</i>	D	75% <i>hartmannii</i> 12.5% <i>hirticalcar</i> 12.5% <i>dilatatus</i>	7
<i>S. Kurumba</i>	<i>S. Victor</i> <i>S. Heidi</i>	D	62.5% <i>hartmannii</i> 25% <i>fitzgeraldii</i> 12.5% <i>hirticalcar</i>	18

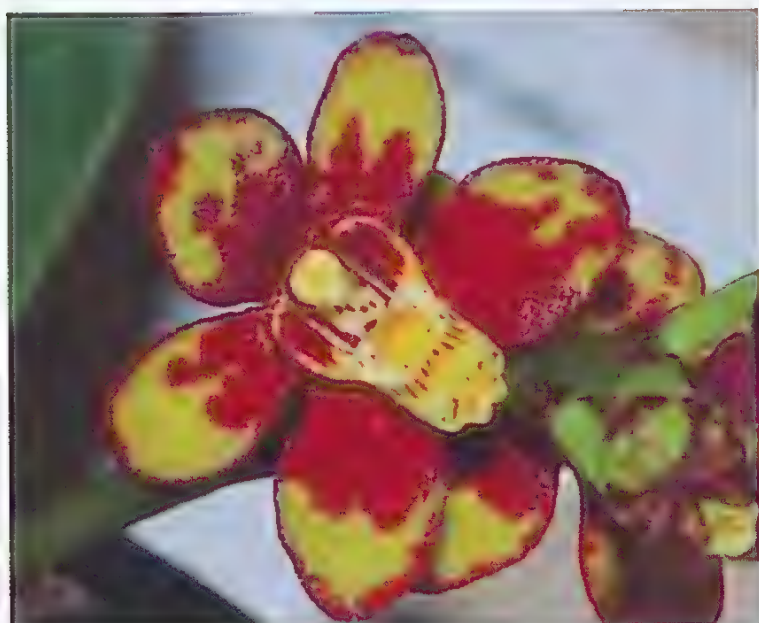
Table 2. Selected *Sarcochilus hirticalcar* hybrids with a high number of progeny.



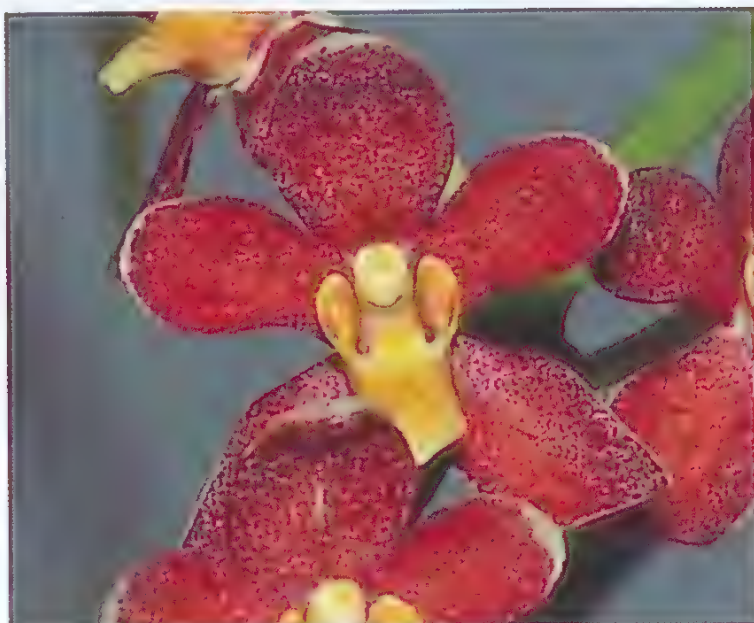
Sarcochilus Nicky
(*S. fitzgeraldii* x *S. hirticalcar*)



Sarcochilus Sundaani's Galaxy
(*S. Parma* x *S. Galaxy*)



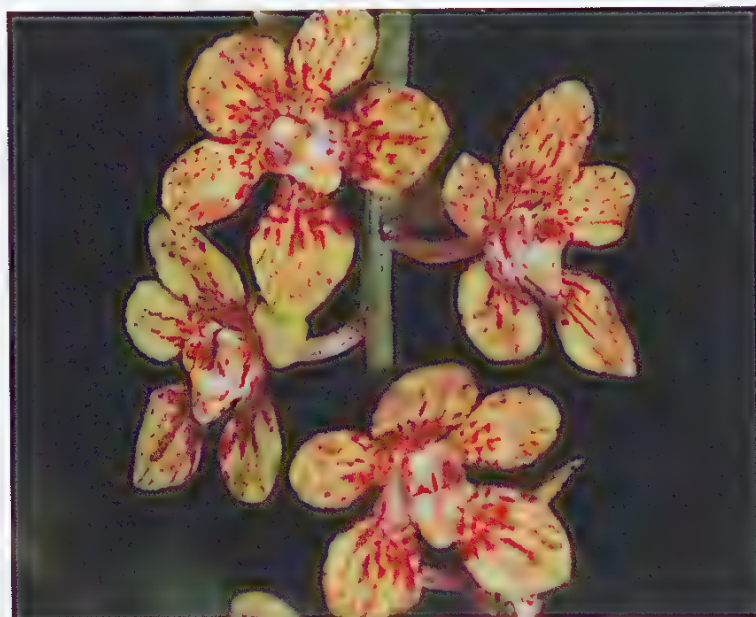
Sarcochilus Velvet Dawn
(*S. Aussie Dawn* x *S. Velvet*)



Sarcochilus Velvet
(*S. Nicky* x *S. Riverdene*)



Sarcochilus Velvet 'Nugget'
(*S. Nicky* x *S. Riverdene*)



Sarcochilus Galaxy
(*S. Misty* x *S. hartmannii*)



Sarcochilus Erin 'Anna' AM /AOC 2015 (NSW)
(*S. Snowhart* x *S. Duno Nickys Twin*)

an HCC/AOC NSW for grower R. Lewry. The hybrid was made by Neil Finch and registered by him the same year. The species itself was not awarded by any judging system until 1999 when it received a Certificate of Horticultural Merit from the American Orchid Society (Oklahoma). To date the only Australian judging system to award the species has been OSCOV in Victoria which granted a Highly Commended Certificate to *Parasarcochilus hirticalcar* 'Yannies Charm' HCC/OSCOV in 2002.

Forty-eight hybrids have received a total of 195 awards internationally, and six hybrids have received ANOS awards.

The hybrids most awarded have been from the third and fourth generations of breeding (Table 1, Generations C and D). Of the 26 registered hybrids in Generation C, seven hybrids have received a total of 30 awards. Of the 86 registered hybrids in Generation D, 28 hybrids have received a total of 135 awards.

Remembering the measures of success, if we pick out which hybrids in Generation C and D have received the most awards and/or have a large number of progeny, it is easy to identify the four most significant hybrids as shown in Table 2 and discussed below.

It is important to note that the numbers of hybrids are increasing rapidly and comparing the generations today will give a different result if the same analysis is made next year or later. The plants in recent generations are still maturing and may be awarded given time. Hybrid remakes using superior parents from earlier generations can result in more superior offspring, which may impress judges and lead to more awards.

Sarcochilus Velvet (Registered by N. Finch 1998)

The parents, *S. Nicky* and *S. Riverdene*, are both primary hybrids, so the background species composition is 50% *S. hirticalcar*, 25% *S. hartmannii* and 25% *S. fitzgeraldii*. There are 30 first-generation hybrids and 19 second-generation hybrids registered between 2005 and 2019 from this parent, and 37 awards to this hybrid and its progeny.

As might be predicted, the influence of *S. hirticalcar* on the outstanding features of the best examples of *S. Velvet* and its progeny include the attractive yellow flower colour. Plants have full yellow flower segments or a yellow undertone with red or brown markings. Equally important is its tendency to flower in cultivation during the summer and autumn when most other *Sarcochilus* species do not flower. These advantageous traits do not transmit equally to all progeny, and the influence lessens in subsequent generations if other species become more prominent in the hybrid's background. The desire to obtain offspring with filled-in and round flower shapes by reinforcing the influence of *S. hartmannii* will inevitably reduce the potential for summer flowering and yellow colours.

Sarcochilus Duno Nicky's Twin (Registered by Down Under Native Orchids 1998)

This cross is *S. Nicky* x *S. Fitzhart*, with a background composition of 50% *S. fitzgeraldii*, 25% *S. hartmannii* and 25% *S. hirticalcar*. There are 35 first-generation hybrids of this cross,

and six second-generation hybrids between 2009–18. There are a huge 105 awards to the hybrid and its progeny. The heavy substance of the flowers of this hybrid and its progeny is one of its best features. Flower colours can be more creamy and less yellow in early progeny, but with a more filled-in shape. *Sarcochilus* Magic is an important progeny and good examples display solid intense red/crimson colours. In my collection, none have flowered in summer.

Sarcochilus Galaxy (Registered D. Butler 2008)

This cross is *S. Misty* x *S. hartmannii*. Background species composition is 75% *S. hartmannii*, 12.5% *S. hirticalcar* and 12.5% *S. dilatatus*. There are 21 first-generation hybrids made from this hybrid between 2012–19. It has seven awards including its progeny. The outstanding features of many good examples of *S. Galaxy* and its progeny are the yellow and orange colours and filled-in shape.

Sarcochilus Kurumba (Registered by Barrita Orchids. Originator J. Whitney 2011)

This cross is *S. Victor* x *S. Heidi* and the background composition is 62.5% *S. hartmannii*, 25% *S. fitzgeraldii* and 12.5% *S. hirticalcar*. The cross has nine first-generation hybrids and 23 second-generation hybrids between 2013–19. There are 18 awards for this hybrid and its progeny. The high background contribution of *S. hartmannii* tends to result in a filled-in shape. Notably, this line of breeding appears to have not slowed. Most registrations are by Barrita Orchids. In contrast to the other three hybrids discussed, the number of progeny in subsequent generations is already far above the number of registered hybrids in the first generation of hybrids, with a relatively high number of awards in the later generations E and F.

Judging

In ANOS judging, both classic (rounded, circular, with filled-in segments) and non-classic shapes are appreciated and awarded. Non-classic shapes are judged in their own

categories, with expected appearances closer to the species, and judged by comparison with the best expected from the parentage.

The optimums for flower size, numbers, presentation, and attractiveness and clarity of colour are important considerations. Non-classic judging of *S. hirticalcar* hybrids involves consideration of the amount and influence of the species in the hybrid, allowing for non-filled-in flowers with the segment features of *S. hirticalcar* when this is an expected result.

Acknowledgements

Sheryl Lawson and Peter Adams for their knowledge and immense support. Roslyn Capell for her invaluable advice and for sourcing the images.

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This article is based on a written project submitted as part of the Victorian ANOS Judge Training Course requirements in 2020.

Orchids with Variegated Foliage

Text and photographs Trevor and Pam Porteous | portefam@optusnet.com.au

In Japanese society orchids with variegated foliage are widely appreciated and regarded as treasures. On our trip to Taiwan in 2020, we were interested to see a number of variegated orchids, probably the most common being *Cymbidium sinensis*. You can imagine the surprise when we also saw variegated plants of *Dendrobium speciosum* and *D. kingianum*.

This was intriguing, and gave rise to the following questions:

- How does variegation come about? Is it natural and can it be achieved by artificial means?
- How reliably does this breed into progeny and can plants be mericlone?
- How robust are plants with variegated leaves?

Variegation in leaves is due to a lack of chlorophyll in some cells, which leaves part or all of some leaves without any green colour. Variegation in leaves can occur naturally. It should be distinguished from mottled leaves which are also very prized, for example, some *Phalaenopsis* species. It can be the result of a past cell mutation that is inherited. Genetic or germ line mutations are inherited genetic alterations that occur in the germ cells (sperm and eggs). Somatic mutations are random mutations that can be caused by environmental factors such as ultraviolet radiation from the sun, or if an error is made as DNA is copied during cell division. Variegation can also be caused by viruses, and deliberately developed using chemicals.

Originally, variegation occurred from random genetic mutations, and the plants were rare and much sought after. Forward to modern science, and Japan and Taiwan have become leaders in genetically modifying orchid DNA by introducing a virus that affects the chlorophyll and produces variegation.

Viruses are a very effective means of introducing a desired characteristic to a plant, for example, iridescent flowers which have been genetically modified.

In researching the topic, we found a patent from 1987 (European Patent Office) for a process to remove the problems faced when producing variegated plants, such as lack of stability of colour, and plants being less robust. The European patent described using chlorophyll-inhibiting compounds, which were mainly introduced by direct application to various plant genera.

..it is possible to artificially produce variegated plants with different and highly ornamental value through the utilization of the respective properties of the various types of chlorophyll inhibitors. In addition, it was confirmed that the variegated plants thus obtained are as strong and stout as the green leaf plants in their cold resistance, light resistance, pest resistance, and other characteristics, as well as in their growth rate, breeding coefficient, etc. Also, it is easy to cultivate the thus obtained variegated plants.

This information would seem to answer another of our questions. We assumed that plants wouldn't be as robust and vigorous due to lack of chlorophyll, but this doesn't seem to always be the case. The variegated orchids seen on our trip looked like normal, healthy seedlings. It seems that the sunlight, which is made up of various colour bands, can still enable photosynthesis to occur using the other light bands. Chlorophyll reflects green so the plant is absorbing the red and some blue bands. A plant with mostly yellow foliage is still absorbing the red and blue bands.

Blue and red wavelengths are important in photosynthesis. The only wavelengths not absorbed are in the green parts of the white light spectrum. If the leaf colours are yellow, It is assumed that



Seedlings of *Dendrobium speciosum* with variegated leaves.



Purchased flask of *Dendrobium Enobi Purple*.



Seedlings of *Dendrobium* with variegated leaves.



Seedlings of *Dendrobium kingianum* in flower, with variegated leaves.



Aeridinae plants with variegated leaves.



Dendrobium speciosum seedling with variegated leaves.

we see less of the green/red parts of the spectrum around 600 nm not absorbed. Our reading suggests that even yellow leaves are still absorbing in the red and blue parts of the spectrum and may be able to obtain sufficient energy to complete the conversion of carbon dioxide and water into carbohydrates and oxygen. Opinions vary on the resultant requirements of variegated plants, from needing more light because of the reduced chlorophyll to less light because the plant is perhaps more likely to burn.

This aspect of orchids was intriguing, and we enjoyed finding out more about it, although we are none the wiser about why Australian orchids were chosen as candidates for variegation. In the name of science, we made a sacrifice and one of us (Trev) purchased a flask of *Den. Enobi Purple* with variegated leaves. The leaves exhibited much more white and pale yellow. *Dendrobium Enobi Purple* is not ANOS-eligible as it has 1.6% *Den. taurinum* in its background, however, it was the closest we could get to ANOS-eligible in a flask, which was the only way we could bring plants back to Australia through quarantine. As can be seen from the photograph, the plants looked quite robust when we purchased them. One interesting aspect was the reaction of an inspector at the airport who thought we'd bought a 'dud' flask. She was surprised when we told her they were meant to be like that!

Follow up

In our flask of *D. Enobi Purple*, there were three plants with fully green leaves, a few had small areas of green colour and the rest were predominantly white. We bought the flask in autumn and had hoped not to deflask the plants until early spring. Over the winter the flask was kept in a warm, bright area inside the house.

Unfortunately, in mid-winter the leaves of the white plants became translucent, and we were forced to remove the plants from the flask, despite the fact that they had small or no pseudobulbs. Any pseudobulbs were very small in comparison to those of the green plants. Very few of the white plants made a successful transition to a community pot and after a short while, they all died. The three green plants have grown quite well and are continuing to thrive in our hothouse conditions.

The conclusion was that plants lacking chlorophyll just weren't as vigorous in the flask or following deflasking, which confirmed what we had expected. We also thought back to our trip to Taiwan where the plants which we saw (as per photographs) had variegated leaves, but not pure white/pale yellow like so many of ours. We don't recall seeing any plants with no green, so it is likely they just don't survive due to the absence of chlorophyll.

Acknowledgements

Thanks to Noel Grundon for discussion and information which added greatly to our understanding of and knowledge of this topic.

References

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Extra note.

Vanda falcata (syn. *Neofinetia falcata*) is in Tribe *Vandae* and is native to Japan, China and Korea. It is remarkable and grown for the foliage, and the species has been cultured and prized by the Japanese for hundreds of years, including variegated forms. Plants were originally owned and grown only by the ruling class. There are whole shows devoted to this species, and several different judging categories are based on the style of variegation, as well as the variable plant size and shape.



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S. Duno Nickys Twin 'Voo Doo' HCC-AD/ANOS 2003; AM-AD/AOS 2007 Photo: Roslyn Capell